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THE CANCER PROBLEM FROM A SURGICAL VIEWPOINT; WITH A POSSIBLE EXPLANATION OF THE REMARKABLE FREEDOM OF THE DUODENUM FROM CANCER INVASION.*

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The proportion of cases of malignant disease which I have seen during the past year has been much greater than in my previous experience. The fact that nearly all these cases were advanced beyond all hope of cure, or even palliation, is very depressing. It is all very well for the surgeon to lay the blame for this state of things on the medical men, but I doubt very much whether increased vigilance on the part of the medical practitioner is going to lower the present mortality from cancer to any very great degree. Popular instruction on the subject of cancer may bring the laity into better cooperation with the physician in the matter of the early diagnosis of malignant disease and the intelligent consent to proper operative treatment. But it is human nature to procrastinate, especially when the alternative is the dreaded surgeon's knife. I doubt whether we shall ever be able to bring a large proportion of individuals to assent to early exploratory operation for cancer of the stomach in its so-called curative stage (before it has a distinguishing symptomatology), and I am also sure that no considerable proportion of women past forty are going to subject themselves to examination every three months for the early detection of possible cancer of the uterus as has been proposed. With the surgical cure of cancer of the breast the possibilities are greater, the disease being more accessible here. The thing for the whole profession to do is to unite in a campaign for the discovery of the cause of cancer, and when the discovery has been made we shall be in a strong position to advise the laity as to prevention and cure, and secure cooperation. A great warfare against tuberculosis is now being waged, and profession and laity are uniting in intelligent action which will be productive of great results. The cause and the cure of tuberculosis are now well known, and the solution of that problem is clear. But not so with cancer, which without question is the greatest problem before the medical world.

Is the surgeon doing his full share towards the solution of this great problem? The criticism has been made that his sole interest in cancer lies in the question, "Can I cut it out?" The disease has been largely relegated to the surgeon, and if the criticism be just, he has not studied it on the broad lines which will go towards an early solution of its cause. He in turn has relegated the problem of its genesis to the pathologist, who also is circumscribed by the problems pertaining to its peculiar cell-phenomena, and apparently has brought us little further than we were a half century ago towards the clearing up of the question. It would seem that only by combination of all branches of the profession in the bringing together of certain definite data, on broad lines, can a possible early solution of the mystery be expected. On the surgeon, therefore, must lie the largest measure of responsibility, because the largest number of cases of malignant disease come into his hands. What few suggestions I have to offer, I fear will seem very inadequate, but if they help to stir up a perennial interest in us in the matter of what is required of surgeons in the elucidation of this terrible scourge, they will have served their purpose.

THEORIES OF THE GENESIS OF CANCER.

Two general theories rule in cancer research today, the theory of cell autonomy (in which no external stimulus is recognized as necessary to the growth of the cancer cell) and the parasitic theory, in which it is maintained that an external microparasitic cause is required to explain the phenomena of cancer occurrence and growth.

Under the first head belong the theories of Cohnheim, Ribbert, Beard and others. Cohnheim held that neoplasms originate from "cell rests"—cells misplaced during embryonic development, and which have failed to undergo a normal atrophy.

* Read before the Brooklyn Surgical Society, February 4, 1909.

This theory did not explain why it is that not all the abundant cell-rests which we may encounter in the human body take on tumorous growth, nor why they so suddenly take on such growth after remaining latent for many years. Cell misplacement, too, is not essential (Adami), as direct cancerous transformation of liver cells has been observed by reliable authorities. Ribbert's theory required cell-displacement as the first essential but held that neoplastic growth is brought about by a diminished external resistance, a lowering of the so-called "tissue-tension" which controls the multiplication of cells and maintains the tissues in normal physiologic condition. This theory, with its later modifications, contains much that seems adequate to the mind of many pathologists to essentially explain the origin of tumors.

The theory of Beard has attracted considerable notice of late and is in essence that all neoplasms originate from misplaced germ- and tropho-blastic cells. The trophoblast is composed of the yolk or nourishing cells of the ovum which do not normally become a portion of the individual proper. Beard believes cancer-cells to be fundamentally identical with the cells composing the trophoblast. Normal trophoblast begins to degenerate and disappear about the seventh week of fetal life, at the same time that the fetal pancreas begins to secret, and Beard jumped to the conclusion that the pancreatic ferments destroyed the trophoblast. The outcome of this was the suggestion that injections of trypsin and amylopsin into the system would likewise destroy the cells of cancer (abnormal or displaced trophoblast). How far this treatment has fallen short of the originator's dreams is well known.

Many more ingenious and philosophical hypotheses have been advanced to explain the origin of tumors, but it would be difficult to attempt to consider them here. None of them, however, gives us any light upon the factor which first starts the cell upon its pathological course as a cancer cell. All of them postulate a cause acting from within the organism, and certain of them do not consider the parasitic theory a valid possibility.

Adami's theory of the origin of tumors recognizes the two properties of a cell—the property of function (secretion, etc.) and the property of growth, or "vegetative" property. For some unexplained reason, cells unable, or uncalled upon, to perform function gain the "habit of growth" and lose the "habit of function." They thus become actively vegetative, as long as they continue to gain nourishment, growing lawlessly in the case of malignant tumors, which also probably excrete toxic substances, weakening the other cells in their neighborhood and leading to unrestrained growth. This hypothesis covers cells *in situ,* as liver cells with full development, or cell-rests which have never been able to assume full function.

The parasitic theory of cancer is simple as compared with the complexities of the cell autonomy theory, and perhaps, as suggested by Ewing, the conception of an invading parasite is crude when placed alongside of it. But while the laboratory worker finds it difficult to accept, it is the theory which explains most to one who looks at cancer and its natural history, on all sides. I shall enumerate the principal points of evidence in favor of the infectivity of cancer:

1. Contact inoculation has been many times observed,—lip to lip, tongue to gum, one labium majus to the other, the infection of a trocar puncture after tapping for cancerous ascites, etc.

2. *Cancer à deux,* wife to husband, patient to nurse, etc., of which a considerable number of authentic cases are reported.

3. Cancer districts, where the disease seems endemic over a period of years. The observations of Behla are most striking, and will bear repeating here. Behla made special study of the house incidence of all cancer deaths in Luckau, a small town in Prussia, which comprises a stationary population of 5,000, for a period of twenty-two and a half years. During this period, about one in 25 of the total deaths of the whole town was due to cancer. The central part of Luckau, which is low-lying and surrounded by ditches, comprising 3,000 inhabitants, furnished 65 cancer deaths. Of its 415 houses, in 33 there had been a single cancer death; in 10, two such deaths; and in 4, three cancer deaths. Its eastern suburb Kalau, which is also low-lying and marshy, being intersected by irrigation canals for market-gardening, comprising 1,000 inhabitants, furnished 73 cancer deaths, or 1 in 9 of its total mortality. Of its 127 houses, in 45 there had been a single cancer death; in 9 two cancer deaths; in 2, three such deaths; and in 1, four deaths. The cancer mortality of this suburb was four-fold that of the central part of Luckau. Of the 40 houses comprising its main street, only 5 were without at least one cancer death; and 56 of the total 73 cancer deaths occurred in the houses of this street. In curious contrast with the foregoing, the high-lying and dry suburb of Sando, comprising 1,000 inhabitants, had not a single death from cancer during the whole twenty-two and a half years.

Similar convincing observations have been made in small towns in this country.

4. Cancer houses. On every hand instances are reported where several cancer cases have occurred in close succession in the same houses. Adami lays no weight upon this, holding that, by the law of chance, an occasional house may show an excess of cases of cancer, as it might show an excess of twin births.

5. The rapid increase in the mortality from cancer in recent years. When all the arguments *pro* and *con* are summed up, there is no question that cancer is very markedly on the increase. The post-mortem statistics of old-established hospitals in Europe reveal an increasing ratio of cases found to be cancerous at autopsy. In San Francisco, the relative number of deaths from cancer increased seven times in the thirty-two years from 1866 to 1898. In Boston, the rate trebled from 1863 to 1887. In New York State, the rate almost doubled in eleven years. In Germany, the deaths from cancer in hospitals in 1879 were 6,330; in 1889, the number had risen to 24,000. It is now some 40,000 or more. It is also attacking at an earlier age, and attacks more men. In England, between 1851 and 1860, the male death rate from cancer was 195, as against the female death rate of 434. In 1901 to 1905, the male death-date had risen to the high figure of 723, as against 997 for the female death-rate. At this rate of increase, the disease will soon be as prevalent among men as women. There is a remarkable decrease in tuberculosis over the same period, the death-rate from tuberculosis declining one-half, while the death-rate from cancer trebled. Williams believes that the massing of the population in cities has made conditions favorable for the development of cancer, and that the relative increase of the disease in men is due, also, to the fact of urbanization, it having changed the natural habits of men more than women to indoor occupations, lack of proper exercise, excess of food, etc. The decline in the prevalence of tuberculous diseases is ascribed to better food and improved hygienic conditions, while the well-fed and well-housed seem more prone to cancer, The world over, statistics point unmistakably to a great increase in cancer.

6. Heredity. I am convinced, and I believe that most medical practitioners of experience are convinced that heredity plays a part in cancer. The great frequency with which we obtain a history of cancer among the blood-relatives of our cancer patients cannot help but impress us with the analogy in respect of heredity to tuberculosis. That there is a hereditary predisposition to cancer in some 10% to 20% of cancer patients, is now widely accepted, although denied by some.

7. Metastasis. Park believes that a strong argument in favor of the exogenesis of cancer is the occurrence of metastases and its termination thereby, and this although the cell with its contents is transported, and not the germ alone. Every metastasis has all the force and significance of a genuine auto-inoculation.

8. Experimental inoculation. Transplantation of malignant tumors among mice and between other animals of the same species has been carried on successfully by many investigators. The discovery also by Gaylord and Clowes that a considerable percentage of animals recover spontaneously from inoculation tumors has been most significant. They also demonstrated that such animals are then immune, and that their blood also exerts a definite immunizing effect upon animals in whom it is injected.

9. Cancer epidemics among animals. It has long been shown that cancer may occur endemically in brook trout hatcheries, and that when healthy fish were introduced into infected pools, they soon acquired the disease. Endemic cancer among cattle has been noted by careful observers. Old cages, in which rats with sarcoma of the thyroid had been kept, infected other rats with the same disease months afterwards, after the cages had lain idle.

Other clinical and experimental evidence can be readily adduced, but we have not time for it here. We have sufficient to show that the parasitic theory forms an explanation for much that we receive little light upon from the histologist confined to his theories of cell autonomy. Many analogies may be struck between cancer and tuberculosis, leprosy, and other infectious diseases, in some of which the micro-parasitic cause which we know to be present has not yet been found.

To the surgeon, cancer in its practical aspect is an infection, purely local at the outset and then reaching out along the lymphatics, taking up residence in neighboring lymph nodes, and later extending to distant parts. If he would treat it successfully he must eradicate it while it is still local, sweeping widely clear of the involved area, lest he open up areas of infection, and reinfect and plant the germs in the fresh tissues, producing involvement more widespread and rapid in its advance than before. Tenacious adherence to this important principle of surgical treatment, following the leadership of such men as Halsted, has made what success surgery has so far accomplished in cancer. To the surgeon, then, the theory of the infectivity of cancer is a

good working hypothesis. It would seem far better that he should accept it, and by his personal contact with it bring to light as many facts bearing upon it as possible, than to wait for the pathologists to explain the cause of the cell-changes in cancer. By the same token he may look forward to the cure of cancer ultimately by other means than surgery.

The conclusions of a scientist of the depth and breadth of Adami may well be included here. He says: "It is not something from without that determines the continued growth (of the cells), not an external stimulus, nor again a diminished external resistance. An external stimulus, it may be, *starts* the cells on that path which leads eventually to their assuming neoplastic properties; diminished external resistance may well favor active neoplastic growth; nay, more, it may well be that cells of a malignant type afford secretions inhibiting the growth, by depressing the vitality, of surrounding tissue cells. But all these are subsidiary. What is of primary importance is that the cells giving origin to an [ordinary] new growth are so modified that the energy acquired by the assimilation of food is not in the main discharged in the performance of function, as in the healthy cell in normal relationship, but is characteristically retained and accumulated for the purposes of cell growth and cell multiplication. . . . . ."

"It is obvious, in the first place, that we hold that little is to be gained from the search for any parasitic cause. Even if found, we believe that once the cancer has taken an active growth, the mere destruction of the parasite would not modify the properties already impressed upon the cell."

He further states that the possibilities in treatment which suggest themselves are along the lines of active immunity produced by extracts from the removed primary growth which might prevent recurrence and bring about the atrophy and disappearance of metatases; and along the line of passive immunity, by destruction of new-growths with drugs or animal products, or agents like the x-ray and radium. However inaccurate the reasoning that led Beard to suggest the use of the pancreatic ferments, there is evidence that in certain cases these ferments act upon the cells of malignant growths, leading to their destruction and absorption, whereas they do not influence similarly the healthy cells.

CANCER OCCURRENCE IN THE ALIMENTARY TRACT.

I have long been interested in the remarkable freedom of the duodenum from the invasion of cancer. The duodenum, as far as the papilla, is to all intents and purposes a part of the stomach. And yet cancer of the duodenum is extremely rare, while cancer of the stomach is the most frequent form of cancer, forming between forty and fifty per cent. of all cancers. Schlesinger found only seven primary cancers of the duodenum in 25,000 histories of cancer. Rolleston collected only 41 cases in the literature.

It is quite generally accepted that cancer develops especially in tissues exposed to long-continued irritation, and in other traumata, scars, chronic ulcers, etc., of long standing. This so-called "precancerous" condition in the stomach is furnished by chronic gastric ulcer, and patients in Mayo's clinic (according to Graham) give a history of antecedent ulcer in 50 per cent. of cases, and in those cases in which partial resection of the stomach was done, 62 per cent. of the specimens showed evidence of an ulcer base. Moynihan states that over 72 per cent. of a series of cases seen by him gave evidence of previous gastric ulcer. Mayo states, also, that duodenal ulcer is more common in his experience than gastric ulcer, in the proportion of above 60 per cent. of the former to about 40 per cent. of the latter. In 1,112 operations on the stomach and duodenum, he has observed but one instance of duodenal ulcer becoming carcinomatous. He has seen, all told, but three other instances of apparently primary carcinoma of the duodenum, although he has in five cases known gastric cancer to develop on the edge of a duodenal ulcer which involved the stomach at the pyloric ring. It has been very interesting to me to note, often, how gastric cancer will extend along the stomach to the pyloric ring, and then stop suddenly short in its progress in that direction, not at all involving the duodenum.

The most striking difference in the involvement of the duodenum by cancer as compared with the stomach has received as yet no attention, beyond the statement of the fact, and an adequate explanation of this difference would be going a long way towards solving the cancer problem. Either it is a mistake that ulcer often forms a precancerous stage in the stomach, or there is lacking in the duodenum the essential cause which gives origin to cancer. There is nothing in the tissue formation of the stomach and of the duodenum to explain the great difference, and no one has shown that misplaced histological cell-elements which might give rise to new growths are vastly more common in the stomach than the duodenum. Can it be explained on the theory that cancer is due to a parasitic cause? It would seem that this would form a reasonable explanation, and that the intestinal secretions are the inhibiting cause which prevents the frequent occurrence of cancer in the upper intestinal tract.

Cancer predominates in the alimentary tract, the U. S. Census Report for 1900 showing that two-thirds of cases of cancer, including both sexes, originated in the alimentary tract. This may go to show that the infection is taken into the mouth, perhaps upon uncooked vegetables and other food, and penetrates the epithelium of the digestive tract far more easily than it can the barrier epithelium of the outer surfaces of the body. Lesions of the mucous membrane form grounds on which the invader may penetrate the cells and inaugurate the tumor growth. It has been shown by Herter that in elder life a large majority of persons give evidence of distinct putrefactive processes in the digestive tract, with acute derangements, during which it is possible that slight but persistent damage may be done to the epithelial and other structures of the intestinal mucosa. It is very probable that cellular alterations occur in the digestive tract in the later years of life, allowing of increased bacterial activity of various kinds. Elder life must bring about a kind of normal involution. Individuals in that period are not ill, but in order to keep fairly well, they have to be careful in their habits of eating and living. I see no reason why these senile changes should not let down the bars to the cancer microorganism and explain the greater incidence of cancer in advanced life, although cancer may appear at any period of life.

It has been shown by Cushing, that the upper part of the intestinal canal contains much less germ-life than the stomach, and that it is often practically sterile, as shown by lack of sepsis following gunshot wounds of that part of the bowel. As the ileocecal valve is approached, a gradual rise in the number of germs is noticed, until the maximum number is reached at that point. In the large intestine there is a marked falling off again, somewhat increasing in proportion to the distance from the cecum. The accompanying diagram shows in a general way the results of experiments on dogs. The dogs were killed three hours after a meal of bread and meat. The lack of bacteria in the duodenum has been ascribed to the antiseptic properties of acid gastric juice, but as this is soon neutralized by the alkaline pancreatic secretion and the bile, it would seem more likely that the pancreatic secretion and the bile are involved in the germ inhibition. As I have said, the pancreatic ferments in certain cases act upon the cells of malignant growths leading to their destruction and absorption, but do not destroy the healthy cells. In these facts may lie not only the explanation of the fact that cancer of the stomach so frequently stops short at the pylorus in its growth towards the duodenum, but also of the extreme rarity of its origin in the upper intestine.

It is an interesting fact that 85 per cent. of intestinal tuberculosis,—and here we know the infection gains entrance with the ingesta,—occurs in the ileocecal region where the bacteria of the bowel are most numerous. Actinomycosis is most frequently found there. It is true that primary cancer is found considerably more frequently in the colon, but this may be explained by the greater amount of contributing irritation of the denser fecal contents of the colon and the reduced amount of pancreatic secretion. The numerical incidence of cancer throughout the whole digestive tract is interesting, and suggests ingestion infection. Of 20,544 cases of cancer in Prussian Hospitals in 1895 and 1896, in 10,537 was the alimentary tract involved, as follows: Tongue, 269 times, mouth and throat, 192; esophagus, 1,011; stomach, 4,238; small intestine, 20; large intestine, 224; rectum, 1,204, (Hiemann).

Gilbert and Domenici Diagram Showing the Relative Number of Bacteria Present in the Contents of Different Parts of the Alimentary Tract.

The small proportion of intestinal involvement as compared with cancer in the alimentary tract above the pylorus is certainly a fact requiring explanation. The additional amount of mechanical trauma connected with the ingestion of solid food might in some measure explain it were not the disproportion so great, and were not our recent knowledge of chronic ulcer in the stomach as a predisposing cause of cancer so complete.

The additional knowledge of the greater incidence of ulcer in the duodenum cannot be disputed, as it has been established by most competent surgeons. It is true, also, that benign tumors are rare in the intestinal tract, but they are likewise rare in the stomach. I cannot bring myself to believe, either, that benign and malignant tumors require the same cause to explain their origin, as the orthodox pathologist would insist, or that there is not greater analogy betwen syphilis and cancer than between a lipoma and cancer. It is, of course, a difficult matter to classify all new growths under the two clinical heads of benign and malignant, but it is also difficult to make a histological classification of tumors. In

the light of future discovery, our general terms of classification will be differentiated into more accurate special classification, the basis of classification probably changing. This has been true in all departments of science, in past time, things apparently similar having been determined to be different in the light of increased knowledge.

I am often confronted with the layman's classification of cancer, as I suppose we all are. When I use the terms cancer and tumor synonymously, he almost invariably corrects me and wishes to know whether I were referring to a tumor, or something which is very different in his mind,—cancer. I confess that I am inclined to think that he has the better of me in his separate classification. Syphilis, tuberculosis, leprosy and cancer are far more closely related clinically than are lipoma and cancer.

For practical purposes, it seems to me that the classification of tumors by Lubarsch more nearly meets our clinical needs: (1) Those which differ from the parent tissue in the arrangement of their elements, etc., which disposes of the teratoid new growths; (2) those which show a certain autonomy (fibromata, liptomata, etc.); and (3) those which are wholly emancipated from the physiological laws of life and rule in the tissues in total lawlessness of growth (carcinoma, sarcoma). Instead of looking for a single etiological explanation of these three provisional divisions of tumors, it may be that a distinct etiology (say) in each instance may place many of the present deeply philosophical theories in proper relation with all the facts. That the last group of tumors has the same essential etiology as the first, I cannot believe. That they are both subject to certain similar laws of growth, I have no doubt. Park has asked, "What explanation can be offered for a sudden local epithelial rebellion except an invasion by some intruder from without?" and his question seems to permit of but one answer.

It will be noted in our statistics of cancer in the alimentary tract that growths occur in the rectum in the proportion of about four-fifths of all intestinal cancers. This would be explained also by the increased trauma in that region with the lack of the pancreatic secretions. Tuberculosis, also, is common in the rectum.

Interesting facts in regard to the geographical distribution of alimentary cancer, and its occurrence in different races, seem to point to its parasitic origin. It is almost unknown—if we are correctly informed—in many tropical countries, which would hardly be the case if it were due to a constant etiological factor within the body itself.

The possibility of the early diagnosis of malignant tumors through a serum reaction has been investigated by Weil, Crile, and others of late, and as yet the results are not of practical diagnostic application, but give promise of future possibilities. This test involves the production of hemolysis, *i e.*, disorganization of the red blood corpuscles through the loss of their hemoglobin. The test is determined by noting the result of suspending normal red cells in the patient's serum and suspending the patient's cells in normal serum. The technic is difficult and not yet fully worked out. It has been shown that the sera in cases of cancer, tuberculosis, syphilis, and certain other conditions contain hemolytic properties. It may be that in this fact lies to some extent the explanation of the cachexia and anemia in late cancer. The results reported by Crile show that of 591 individuals studied, 211 normal subjects showed no hemolysis, 71 cases of pyogenic infection showed hemolysis in 10 per cent., 55 benign tumors no hemolysis, 153 cases of cancer hemolysis in 85 per cent., 11 post-operative cases with recurrence 100 per cent., 37 post-operative cases without clinical recurrence 3 weeks to 15 years after operation no hemolysis, and 52 cases of tuberculosis showed reversed hemolysis in 92 per cent., that is, the corpuscles of tuberculous patients were hemolyzed by normal serum. Crile's conclusion is that from the clinical standpoint hemolysis offers additional evidence, which may be used in the diagnosis of cancer or tuberculosis. Only an occasional early case of cancer failed to show hemolysis.

In concluding this somewhat rambling excursion into the great field of the cancer problem, I can only emphasize my feeling that it is incumbent on us as surgeons, not alone to bend our energies to the early and complete eradication of the disease by operation, but to do our part towards the thorough study of the disease in all its aspects. We cannot all do research work in the laboratory, but we can coöperate with the research laboratory in the use of the material at our command, and be on the watch not only for the operative case, but for the non-operable case which will present evidence of value in the elucidation of the cancer problem. Special hospitals for cancer cases, or special departments of hospitals, should be advocated, and a great service rendered a vast number of helpless incurables who are now refused by practically all our hospitals, thereby, also, promoting the systematic gathering of valuable data bearing on the cause and cure of cancer. It would probably assist us, also, in the matter of laying down rules for the

better selection of cases for operation, as I am convinced that much harm is now done to both surgeon and patient from the many operations on cases really inoperable.

The matter needs our interest fully as much as the matter of the great white plague. In New Jersey, in 1900, the deaths from cancer were more than those from tuberculosis. In New York State, in 1907, more than half as many deaths from cancer occurred as compared with tuberculosis, 7,000 as against 13,000. In the whole country there are approximately 80,000 cases of cancer to-day. One woman in eight who reaches her thirty-fifth year dies of cancer. A disease entailing so much torture to the patient, and such expense and misery to those who care for him, should receive more attention from the government. New York was the first state to appropriate a modest sum to maintain a cancer research laboratory, and I am not sure that any other state has followed its lead. The great need now is for the cancer hospital. This matter should be pushed before the public, and it is incumbent on the surgeon to do it.

1145 DEAN STREET.

EXCISION OF STERNUM FOR SARCOMA.*

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This case is presented as being rather unusual in the location of the tumor as well as in its thorough removal. Also because it suggests the question whether the outlook is sufficiently encouraging to justify the operation in cases of bone sarcoma when the procedure is necessarily a formidable one involving risk to life and the probabilities of recurrence or metastasis, or both, are so great.

Bessie R., aged 46, was admitted to the Beth Israel Hospital on January 7, 1909. She is married 26 years, had 5 children and now is 3 years after menopause. Has been coughing and subject to spells of dyspnea for 15 years, and says that recently she has lost appetite, has been losing flesh and feels generally weak. She has an enlarged left lobe of the thyroid for 17 years, which she says never bothered her. Three months ago she began to have severe sticking pains in the chest to the left of the sternum and then noticed a swelling the size of a small nut to the left of the middle line. This has been growing in size and becoming more painful.

On admission to the hospital the swelling was about the size of a hen's egg, painful on handling and distinctly fluctuating. The skin was not involved nor were there any glands palpable. Temperature was 100°, pulse 116, leucocytes 8800 and polynuclears 74%. Diagnosis lay between sarcoma and tuberculous caries with abscess.

Incision over the mass disclosed a neoplasm involving the lower half of the sternum and extending to the costal articulations on either side. The sternum from the level of the second intercostal space was resected, including about one inch of each of the lower five costal cartilages on either side, that is, from and including the third costal cartilage all the way down through the costal arch. The enucleation was subperiosteal as far as possible, but when the region of the tumor was reached posteriorly, the periosteum and part of the left pleura were found involved and were removed with the tumor, the center of which was a soft gelatinous growth extending through the bone, with a posterior, as well as an anterior, projection. Copious hemorrhage from the intercostal veins behind the tumor was a marked feature of the operation, but was controlled quickly, necessitating numerous skin incisions, to raise sufficient flaps to get at the bleeding point in a hurry. The two main points were behind the sternal articulation with the third rib on either side. The pericardium was not injured. The pleural opening was occluded by sponge pressure until it could be closed, though imperfectly, by suture, which was supplemented by a gauze compress carried out through the skin incision like a drain.

With the tumor removed and the skin flaps yet turned back, there was a sight to behold that is not easily forgotten! There was a deficiency of about five or six inches in diameter in the chest wall, with its floor retracted, forming a cavity of sufficient depth to easily contain a fist; the pericardium, pleura and peritoneum were exposed, and all in motion,—the pericardium with every heart beat, which, at that stage of the operation was about 160 to the minute, and the pleura and peritoneum with every respiration. The general effect was that of a look into a busy machine shop in full action, only the clanking of the machinery was missing.

The flaps were turned in and sutured except for a small opening to carry out the end of the gauze compress over the pleural suture, as well as another strip to check surface oozing of blood.

While there was considerable shock the patient rallied well and, except for a hypostatic pneumonia, which kept her pretty sick for a few days, she made a fairly uneventful recovery. Though there was primary union of the skin edges, healing of the wound was slow on account of the retraction of the bottom of the cavity, from the overlying skin, which resulted in a pocket formation that had to heal by granulation. Now, about five weeks after operation, it is interesting to note the reformation of bone or cartilage that is going on. The costal arch has entirely filled in across the deficiency. This result may be partly due to collapse of its sides for want of the bony support removed, but evidently is mostly due to production of new cartilage on the perichondrium, which here was not removed. Above this re-formed costal arch, where the periosteum was removed with the tumor, there is no regeneration of bone, only the skin flap intervenes between the sur-

* Case presented at a meeting of the East Side Physicians' Association, February 19, 1909.

face and the viscera and, being unsupported, it moves with every heart beat and respiration. The tumor, on examination, proved to be a spindle-celled sarcoma.

About a week after operation the patient began to complain of pain about her right shoulder. Nothing was evident there on examination at that time, and, although she spoke of this pain occasionally she did not make any definite complaint of it until February 14, when an examination showed that the arm just below the shoulder joint was tender and gave an indefinite appearance of a fusiform swelling. On questioning her more closely it developed that she felt this pain even before she came to the hospital, but it was not sufficient to complain of and had stopped entirely for some time after operation. The appearance was suggestive of sarcoma of the upper end of the humerus, and a radiograph confirms that suspicion. Within the past few days there has also been noticed a small bony growth on the outer border of the scapula, which is somewhat tender and most likely another metastatic growth.

Note.—April 14, about three months after operation, the fusiform swelling on the upper part of the humerus has increased to about twice the diameter of the arm and is very painful. The tumor on the scapula has enlarged somewhat, but is not very painful. There is a small recurrent tumor at the left lower corner of the remnant of the sternum at its articulation with the second costal cartilage. The liver is large and tender. The dyspnea is considerably more marked and there is troublesome cough with occasional hemoptysis, indicating probable metastasis in both liver and lung.

TUBERCULOSIS OF THE BREAST.

The onset of the disease is insidious except when it occurs during lactation, when it is of more rapid growth. It may last for years. Only one breast is affected. . . . . In the discrete variety indurated areas may be detected here and there throughout the substance of the gland, but separated apparently from the surrounding tissue. In other cases the outline is indefinite. The skin is not adherent until late in the disease. When it is, fistulæ soon form. Pain is a rare symptom early in the disease, and when present does not exist to a pronounced extent. It may be severe as a late symptom. The confluent form pursues a more rapid course, fistulæ forming early in its evolution. A mass varying in size from a hazelnut to an orange, of irregular outline, hard or soft, is found usually in the upper and outer quadrant. The axillary glands are early involved, rapidly increase in size, and may suppurate. It is to be noted that the glands do not fuse and become matted together as in carcinoma. This is of importance as a differential sign.—W. L. RODMAN in the *Monthly Cyclopedia and Medical Bulletin.*

SOME NOTES ON OTITIC BRAIN ABSCESS.

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Etiology.—The spread of infection from the ear to the brain is accomplished in four ways: (a) Through the tegmen tympani into the middle fossæ. (b) Through the internal auditory meatus and aqueducts into the posterior fossa. (c) Through the inner table covering the sigmoid groove which covers the sinus, into the posterior fossa. (d) Through the spread of the infection from one fossa into the next.

The extension is sometimes direct, and sometimes through the occurrence of phlebitis. All varieties of brain abscess are of infectious origin. They may be the result of infection of the pharynx, of the nasal fossæ and air sinuses, or, as in the great majority of cases, the result of aural infection.

Gross Pathology.—The abscesses occur in all gradations, from an encapsulated abscess with a distinct pyogenic membrane and a minute connection with the original source of infection, to the other extreme—a diffuse softening, a mere enlargement of the original infection.

Diagnosis.—I. If the external conditions have indicated the exposure of the dura mater, it should be critically explored for signs of brain abscess, granulations, necrosis, and fistulæ. Focal symptoms are a fallible guide to the location of an abscess. The location cannot be established until the abscess has been actually demonstrated. When a positive diagnosis of brain abscess is made before the abscess is located, or when there is indication found on the dura mater, the brain may be explored by incision or by aspiration, and a definite diagnosis and location of brain abscess obtained.

II. In peripheral infections with cerebral irritation shown by severe headaches and neuro-retinitis, the diagnosis of brain abscess is provisionally made in the absence of definite symptoms of meningitis and thrombosis, but the diagnosis is not positive until the operation for the peripheral infection has demonstrated the condition of the deep tissues. Upon the condition of these tissues rests the final diagnosis.

The cases where there is a possibility of brain abscess form a group which shows advanced temporal bone infection, with or without intracranial symptoms. In these cases the presence or absence of brain abscess cannot be demonstrated before the primary operation. The diagnosis in all these cases must be withheld until the peripheral infection has been removed surgically.

III. The diagnosis is positive when focal brain symptoms occur with a peripheral infection.

A blood count is useful to determine the presence of active infection and the resistance offered to it by the patient, but is of no value in locating the infection.

Cerebral and cerebellar abscesses differ in their symptoms in the typical cases, but in the atypical cases the symptoms are not definite enough to give any ground for differential diagnosis. The typical cases show focal signs pointing to impaired cerebral function in cerebral abscess, and impaired cerebellar or musculo-dynamic and coördinate functional symptoms for the cerebellar abscess. Optic neuritis is very apt to occur in cerebral abscess. Signs of cerebral pressure are of more frequent occurrence with cerebral abscess. Basilar meningitis is more often associated with cerebellar abscess.

Treatment is operative, and is of two kinds:

I. Peripheral exploratory operations to confirm the diagnosis, and to locate the abscess.

II. Central operation for evacuation and drainage after the abscess has been located. Exploration of all the diseased area and thorough exposure of the abscess is even more necessary than in a superficial cellulitis. The object is to obtain direct drainage rather than drainage by packing and wicks.

It is best to follow the path of infection in planning the location of drainage.

When should we operate for brain abscess? As soon after the diagnosis is made as possible.

When should an exploratory operation be done for brain abscess? As soon as indications of mastoiditis, sinus thrombosis, or meningitis call for operation.

This brings us to the question: When should we operate for mastoiditis? This we should do at the earliest possible moment when the aural inflammation appears to be beyond our control.

After-care.—This must be directed to rigid asepsis to prevent reinfection or extension of infection, preservation of drainage and slow closure of the wound. The patient must be kept quiet for a long time after complete healing is apparent, and must be under observation for a year or more for fear of recurrence.

Hexamethyltetramine (an aid or substitute for surgical treatment) given in doses ranging up to 60 grains a day, by the mouth, is a help to intracranial antisepsis.

Results of Treatment and Prognosis.—In my experience during the last two years, with eight cases,—3 of cerebral abscess, and 5 or cerebral and cerebellar abscesses combined,—there has been 50 per cent. of recoveries after operation. All the cases that terminated fatally were treated under special disadvantages, either from complications, lack of opsonic resistance, or delayed operation. I think the prognosis for cerebellar abscess is slightly better than for cerebral abscess, and that under favorable conditions the prognosis following operation should be for more than 75 per cent. of recoveries. The prognosis without operation is over 99 per cent. fatal.

57 WEST 53RD STREET.

SOME REMARKS ON ABSCESS OF THE BRAIN; REPORT OF TWO CASES, WITH DEATH FROM INSUFFICIENT EXPLORATION.*

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MacEwen says that for the sake of convenience abscess of the brain should be divided into three stages. These stages differ from one another in a marked degree and indicate the progressive stages through which it passes in uninterfered cases.

I do not intend in this paper to treat of traumatic abscess—that is, those due to fracture of the skull or injuries to the head, but to limit our discussion to those infective brain abscesses arising secondary to acute or chronic suppurative affections of some of the adjacent cavities, such as infections of the middle ear or mastoid cells. The great majority of cases in the initiatory stage will give a history of middle ear disease characterized by purulent or semi-purulent discharge from the external auditory meatus, accompanied by more or less pain at some previous time. Other cases will deny ever having had pain or discharge from the ear, but a careful examination of the external canal will usually disclose a discharge with perforation of the tympanic membrane. The discharge is sometimes very slight and consists apparently of not much pus, but chiefly serum. The pain in the ear is first described as shooting or burning in character. At first the pain is confined to the ear, but soon extends to the temple and mastoid regions; later to the occipital and frontal regions. Pain is even felt in the frontal regions when the abscess is located in the cerebellum. As the disease progresses the pain increases until the patient complains most bitterly, often crying aloud on account of the great suffering. In other cases it is more neuralgic and paroxysmal in character, and

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can be relieved only by large doses of morphine given hypodermatically.

Vomiting is frequent, and bears no relation to food or to stomach disorder, and is usually without nausea. Rigors or chilly sensations are usually symptoms of the early stage. They may be severe or slight and hardly noticeable, but if looked for carefully they will be found to exist, or to have previously been present. These rigors should not be confounded with the more severe and repeated rigors of other acute affections arising from the middle ear or mastoid suppuration, such as sinus thrombosis, and are differentiated from the chills of sinus thrombosis by their less frequency and severity, together with lack of tenderness along the course of the internal jugular vein. The temperature during the first stage is only slightly above normal, not reaching more than 99° or 100° F. On the tongue is a white, thin coating and the pulse is quickened.

The initial stage usually lasts from two to six days, when the symptoms are greatly changed, the patient passing into the second stage, which is characterized by symptoms of intracranial pressure. It is in the second stage that the surgeon first sees abscess of the brain, and quite often not until the third stage of the disease has made its appearance. At this time the patient lapses into a condition of stupor or mental dulness. He does not compiain so much of pain as before; his senses are dull and he passes a good part of his time dozing. He is easily aroused, however, and replies to questions slowly but quite accurately, but it is with difficulty that his attention can be held for more than a short time on account of the tendency to doze off again. Percussion over the affected side is usually painful. The pain is complained of even in this stupid mental condition. This symptom I found to have been constant in my cases. The temperature in the second stage is generally near normal, ranging from a degree above to a degree below normal. The tendency of the temperature to be subnormal is quite typical of brain abscess, and this is quite the contrary in sinus thrombosis and other acute infections with which brain abscess may be confounded, such as a meningitis, arising from a spreading infection of the middle ear.

The pulse in this stage is slow, not more than 50 or 60 beats per minute, and may reach as low as 30 or 40 per minute. The respiration at this stage is also slow, but usually regular. MacEwen says that respiration is often reduced to as low as 11 per minute, and in cerebellar abscess is slower than in cerebral abscess, often irregular and of Cheyne-Stokes character. The pressure on the cerebellum affecting the pons, the respiration often ceases long before the heart beat does. In one case of cerebellar abscess cited by MacEwen life was prolonged for twenty-four hours by performing artificial respiration after respiration had completely ceased. Constipation is the rule, and it is often most obstinate. The urine is scanty and often retained, making catheterization necessary. It also contains albumin, which soon disappears upon draining the abscess. The appetite is lost and the patient has to be encouraged to eat. Vomiting in this stage is not as usual as in the early stage, but in some cases it does occur throughout the entire course of the disease. Convulsions sometimes occur, but are not often a feature unless the abscess is located in or near the motor regions of the brain. Paralysis sometimes occurs from the destruction of brain substance or pressure exerted upon conducting tracts. Paralysis is of importance in locating the abscess, as it is quite evident that the abscess must be quite near to the centers involved in the paralysis. The breath has a foul odor that is quite characteristic in all cerebral affections. This is a constant symptom observed in my experience in brain cases. The odor cannot be described and can only be appreciated by frequent contact with cases. It is present in brain tumors as well as acute infections of the membranes, as well as the brain itself. The reflexes are not of much diagnostic importance. Optic neuritis is often present in the latter end of the second stage, and when present is an important diagnostic symptom, although it is present in other diseases of the brain, more particularly tumor.

The third or last stage of the disease usually ends in death, when the condition is not treated surgically. However, abscesses of the brain have become encysted, remaining innocuous for years. Gowers reported a case that had evidently existed for twenty years. Death is usually due to a gradually increasing coma or to a leaking of the abscess upon the surface of the brain, setting up an acute lepto-meningitis which is rapidly fatal. Or it may be due to a discharge of the abscess into one of the lateral ventricles. In case the discharge is into one of the ventricles, the symptoms suddenly become alarming and death ensues within a few hours.

The treatment of brain abscess is entirely surgical. The operation is performed in the following manner:

After shaving the entire scalp it is thoroughly cleansed by scrubbing with soap and water and applying some antiseptic dressing over night. The dressing I prefer is a gauze pack wet in bichloride of mercury solution, 1-1,000. This may be followed

after the patient has been anesthetized, just previous to the operation, by the application to the scalp of Harrington's solution, which is left in contact with the scalp for not less than three minutes, when it is washed off with sterile water. If these directions are followed out, the scalp will be made reasonably sterile. There is no operation in surgery where greater care is required in rendering the operative field aseptic and in keeping it so than in operations upon the cranial cavity. The abdominal cavity will often tolerate an abundance of abuse and maltreatment, but not so the cranial cavity. The meningeal membranes are very prone to inflammatory processes; and the cerebrospinal fluid furnishes a most excellent culture medium when once infected, lighting up an acute lepto-meningitis that is always rapidly fatal. Knowing these facts, it is the duty of the surgeon to take every precaution to prevent infection during operations upon the cranial cavity.

If an abscess is suspected as a result of middle ear or mastoid disease, it will be necessary to open the mastoid for the purpose of draining the antrum and middle ear, if this operation has not already been done. The opening of the mastoid should be done immediately after the brain abscess has been drained, and not before. If this operation is done last, it will often avoid infecting the cranial contents. A large or medium-sized trephine opening is made over the suspected seat of the abscess and the brain explored with a medium-sized trocar. If an abscess is near the opening the brain will bulge into the opening and will not pulsate. The trocar is introduced slowly and carefully in the direction of the suspected abscess, withdrawing the stillette at every half-inch advance. If pus does not escape through the canula after the trocar has been introduced to the depth of an inch or not more than an inch and a half, it is best to withdraw it and reintroduce it, changing the direction either upward, downward, forward or backward, if pus is not reached. In case one is not successful in locating pus through the first trephine opening, other openings should be made and the brain thoroughly explored through them. The cerebellar fossa should also be explored before abandoning the operation. I have missed locating two brain abscesses within the last two years by being too timid and not carrying my exploration far enough. If a free flow of clear fluid escapes through the canula either a brain cyst or one of the lateral ventricles has been entered. Sometimes the lateral ventricles will be greatly distended with fluid, as evidenced by the large amount of fluid escaping through the canula. This has happened to me in one case and led me to believe that a brain cyst had been entered. The distention of the ventricle in that case was due to pressure made upon the fourth ventricle by a cerebellar abscess. This symptom should always lead us to explore the cerebellum. After the abscess has been located by the trocar, the opening into it may be enlarged by passing into it a closed dressing forceps, using the instrument as a dilator, gradually enlarging the opening until the finger can be introduced into the abscess cavity for the purpose of cleaning out any semi-solid masses that may be present. Irrigation of the abscess cavity is not necessary and is dangerous. Drainage is necessary and may be accomplished by the ordinary rubber tube. MacEwen uses the decalcified chicken-bone drainage tube. These tubes are not always obtainable, and in my opinion the ordinary rubber tube will answer the purpose very well.

CASE I. Steve D., male, aged 31, was admitted to St. Mary's Hospital, Duluth, March 22, 1907, and was referred to me by Dr. Lum. He was taken ill about the fourth day of October, 1906, with pain in the left ear; and had been admitted to St. Mary's Hospital, October 19, 1906, remaining there one week. At that time a diagnosis of mastoid disease was made. He was readmitted November 2, 1906, and operated upon soon after by Dr. Lum. He evidently recovered from the mastoid trouble; a few weeks later and before leaving the hospital a swelling in the left cervical region made its appearance just below the hairy portion of the scalp. At that time I saw the case in consultation with Dr. Lum, and a diagnosis was made of abscess involving the soft part of the neck only, located at the point of the swelling. This abscess was opened by Dr. Lum a few hours later. At the time of the consultation the patient was stupid, answered questions slowly and with difficulty, had an occasional increase of temperature above the normal, but most of the time it was normal or subnormal in character. He improved so much that he was again discharged from the hospital, February 28, 1907. When readmitted, March 22, 1907, he was suffering from severe headache, making necessary large doses of morphine hypodermatically. He was mentally dull and answered questions slowly but usually correctly. The tongue showed a whitish furred coating; the breath was very offensive; temperature 97°; pulse 60. He vomited almost daily after the last admission; the vomiting seemed to have no connection with the taking of food. The temperature never reached a higher point than 99°, and it was usually taken per rectum. Pain continued and was referred to the left side of the head, being also reflected toward the frontal region. At this time percussion over the temple and parietal regions on the left side was painful. There was no discharge from either of the old wounds; neither was there any discharge from the ear. There was optic neuritis and mydriasis on the left side. A diagnosis of brain abscess was made April 3, 1907.

Operation, April 4, 1907: The first trephine opening was made over the left cerebellar fossa, the dura incised and a trocar passed into the cerebellum in two directions. No pus or other fluid was found. This opening was closed after replacing the button of bone removed by the trephine. Another opening was then made in the skull by a good-sized trephine about 1¼ inches above the external auditory canal; the dura bulged into the opening and pulsation was absent. The dura was incised and the trocar passed into the brain inward and downward for about 1½ inches. Nothing escaped through the canula. It was then reintroduced directly toward the lateral ventricle for a distance of about 1¼ inches, without result, and further exploration of the brain was abandoned. The wounds were closed by replacing the button of bone, and without drainage. The patient died April 9, 1907.

Autopsy: The cerebellum was normal. There was an abscess in the lower temporal lobe of the left side, about ½ inch from the surface, 3 inches long by 1 inch deep, containing about four ounces of greenish creamy pus. The trocar used in exploring the brain at the operation had missed the anterior horn of the abscess by only ¼ of an inch, and if it had been directed posteriorly a little more it would have entered the abscess cavity.

This case emphasizes the necessity of more thorough exploration of the brain in suspected abscess. If we had not been quite so timid and had made our exploration a little more thorough, the abscess would have been discovered, and the patient's life probably saved.

CASE II. John B., aged 29, admitted May 17, 1907. Family history negative; also personal history, as far as any specific disease was concerned. He was taken sick in February, with earache, lasting two weeks. Pus discharged from the ear four or five days. He had been ill six or seven days when admitted to the hospital. He then complained of being very dizzy. He gave a history of having had headache some time in the beginning, but there was no headache on admission. Vomits nearly everything taken into the stomach; ptosis of the left eyelid; pupils react normally; sees double when looking with both eyes; tongue coated; breath foul; temperature normal; pulse normal; bowels constipated; appetite poor. The temperature at no time during his illness has been more than 98.4°, and it has been subnormal most of the time. The pulse ranges from 60 to 80 per minute; bowels very much more constipated; vomiting continued at intervals throughout the entire course of the disease, often being induced by assuming the upright position. The vertigo greatly increased as the disease progressed, becoming so marked at times that the patient could not stand without falling. About thirty days after admission to the hospital, and thirty-seven days from the onset of the disease, a diagnosis was made of abscess of the brain, probably located in the cerebellum.

Operation: A trephine opening, medium-sized, was made about 1¼ inches above the external auditory canal. When the dura was exposed it bulged into the opening; pulsation was absent. The dura was incised at this point; a trocar was inserted about ½ inch; when the stillette was withdrawn a copious flow of clear fluid occurred. This fluid was evidently under quite a pressure, as it spurted through the canula. The amount evacuated was about eight ounces. Believing that the trocar had entered a brain cyst, further exploration was not deemed advisable, so the cyst was treated by drainage. Death occurred about thirty-six hours later.

Autopsy: The brain was removed, the surface appearing normal except over a small area corresponding to the petrous portion of the temporal bone on the left side. On section of the brain it was discovered that the trocar had entered not a cyst, as supposed, but the left lateral ventricle, greatly distended by cerebro-spinal fluid. The pressure of the fluid had caused a thinning of the cortical substance of the brain over the ventricle, until it was not more than one-quarter inch thick. Upon section of the cerebellum an abscess of the left lobe was discovered containing about one ounce of thick, greenish-yellow pus. The abscess cavity was heart-shaped and contained considerable solid matter.

Although we had suspected cerebellar abscess for the reason that the most tender point on percussion was over the parietal bone, we opened into the parietal region first, instead of the cerebellar fossa, and laboring under the impression that we had drained a brain cyst, the cerebellar fossa was not opened. The abscess had apparently made pressure either upon the fourth ventricle or the aqueduct of Sylvius in such a way as to prevent the free and equalizing flow of the cerebro-spinal fluid, consequently causing the distention of the lateral ventricle. This symptom the great distention of the lateral ventricle, if we had recognized it, should have led us to explore the cerebellum at once.

In conclusion, I desire to make a plea for a more thorough exploration of the brain in suspected abscess.

From the experience, observation and study of these cases, I am satisfied that, as a rule, the surgeon of ordinary experience is far too timid in his exploration of the brain. These cases are hopeless unless the abscess is located and drained. Knowing this, we are justified, in my opinion, in undertaking almost any operative procedure in our efforts to locate and drain the abscess. I remember the late Dr. Fenger demonstrating what he termed his systematic exploration of the brain for suspected abscess before the Surgical Section of the American Medical Association, at its meeting in St. Paul, 1901. I was surprised at the time with what seemed to me Dr. Fenger's reckless disregard for the brain. He used a skull to demonstrate his method, with numerous trephine openings through which he in-

troduced his trocar or aspiration needle, passing it first in one direction, then another, if pus was not found, until the entire hemisphere had been explored. I am now of the opinion that his method is the proper one, and that we are more apt to err upon the side of caution than otherwise. In my future cases I am determined that my exploration will be sufficiently exhaustive that abscesses like the last two will not be overlooked, believing that exploration of the most searching character is not only justifiable, but demanded, in order that the lives of at least some of these unfortunates may be saved.

A BRIEF REVIEW OF THE APPLICATIONS OF ROENTGEN RAYS IN DIAGNOSIS.*

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When the *x*-ray was new, some twelve or thirteen years ago, printers' ink was used unsparingly in exploiting the wonderful discovery and its possibilities in diagnosis. The casual reader was led to believe that it was a wonderful light with which we could photograph anything we desired to see, no matter how securely hidden from our unaided eyes by brick walls, by the most elaborate creations of the sartorial art, or by the skin and fascia and other tissues with which Nature has surrounded our vital organs. The expression, "photography of the invisible," was current not only in lay journals, but in those of scientific pretensions as well. For a year or two every physical laboratory was the scene of experiments with the new rays which Roentgen had discovered and which Crookes and other experimenters had produced during the preceding 20 years and failed to recognize.

The list of alleged "first successful radiographs made in this country" is astonishingly long. These early radiographs were exceedingly indistinct shadows of the bones of the hand or of dead mice, or else some metallic object like a key, produced by exposing a photographic plate for minutes or hours to the feeble rays obtained from the imperfect appliances then available. It was predicted that every medical man would soon have in his office a little machine enabling him to obtain views of the human body such as hitherto had been possible only at the autopsy table or the anatomical laboratory. These predictions have failed to materialize.

After such over-enthusiastic statements had ceased to appear as news items, it was found that the imperfect radiographs of that day were proving very useful in the diagnosis of a few bone injuries, and in the localization of foreign metallic bodies. At this time the period of active investigation had passed and the practical application of the rays had been taken up by a few physicians whose tastes inclined toward physical laboratory work, and by a few engineers, photographers and electricians to whom we are indebted for the development of many practical details. These pioneers were able, by making exposures of from three to twenty minutes to obtain radiographs of the extremities, which were useful in the localization of needles, bullets, etc., and the diagnosis of fractures and dislocations.

The fluoroscope was used extensively not only for diagnostic examinations, but for testing the rays emitted from the tube, the penetrating power of which was very changeable and required constant adjustment. Little was known of the physiological effect of the rays and the seriousness of the injuries they produced was not suspected. It was then the almost universal custom of the operator to test the rays by examining his own hand in the fluoroscope. When he made a fluoroscopic examination of an arm or a leg he held the fluoroscope with one hand and the object he was examining with the other. He noticed that the skin on the backs of his hands became irritated and uncomfortable, but expected this condition to disappear like sunburn. This was the beginning of the long series of injuries to operators which have of late been proving so fatal. Those who have taken up the work within the last five or six years have practically all escaped serious injury, and there need be no repetition of the tragedies which were a consequence of the first years of experimental work.

Because of the long exposures then necessary for making radiographs, and the imperfect control of the quality of the rays, some exceedingly severe *x*-ray injuries appeared in a few patients submitted to examination. These unfortunate accidents and the uncertainty of success of the early attempts at radiography, caused a fear and distrust of the *x*-ray which has not yet entirely disappeared. However, confidence began to return, and with the improvement of appliances and technic which followed, the field of usefulness of the rays has been steadily enlarging, and will probably grow for some years to come.

By the end of 1897 successful radiographs of renal calculi had been made. The pioneer work of Dr. Charles Lester Leonard, of Philadelphia, in

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this then new application deserves the highest praise. At that time the duration of the exposure for a radiograph of the kidney region was ten or fifteen minutes or more, and little detail was shown in the plates. If the shadow of a stone was obtained its presence was proven, but if no such shadow appeared, the negative diagnosis was not indicated. Now, with improved appliance and technic we make these exposures during suspended respiration in from one to ten seconds. We usually obtain shadows of the kidneys which give us accurate information as to their size, shape and position. Practically all calculi large enough to cause symptoms can be shown except those of pure urates or uric acid, and these are fortunately very rare.

The success of the Roentgen diagnosis of urinary calculi led many to attempt to show gall-stones in the same way. Most gall-stones, however, offer scarcely any more obstruction to the rays than the soft tissues which surround them, and it is obvious that such stones cannot be demontrated in the radiograph. If the stones are not shown it is no indication that cholesterin stones may not be present.

Gall-stones containing enough calcium salts to give perceptible shadows occur occasionally, and have been successfully shown in radiographs. I have seen one case in which a set of plates made by Dr. George E. Pfahler, of Philadelphia, clearly demonstrated the presence of such stones, and were of diagnostic value. I have seen many alleged gall-stone radiographs which really showed nothing but fog and a few finger marks, developer spots or other artifacts and which apparently were exploited either through unpraiseworthy motives or through an unpardonable ignorance of the subject of Roentgen ray diagnosis.

In 1899 the *x*-ray was being used in the diagnosis of aneurisms of the arch of the aorta, tumors of the mediastinum, tuberculosis, consolidations of the lungs and other lesions of the organs in the thorax. Prominent among these early workers was Dr. F. H. Williams, of Boston, who, very early in the history of the *x*-ray, established an elaborate equipment at the Boston City Hospital, where he examined hundreds of thoraces with the fluorescent screen and the photographic plate. The screen has proven useful in showing the movements of the diaphragm and the pulsations of the heart. The difference in the excursions of the diaphragm on the two sides due to impairment of function of one lung can be demonstrated clearly on the fluorescent screen, and has become known as "Williams' sign."

In order to obtain all possible detail in the radiograph it is necessary that the exposure be made while the lungs are at rest. Von Ziemsen and Rieder in Munich, using the technic proposed by Rosenthal, were able as early as 1900 to make beautiful radiographs of the thorax with exposures of one second and less. Most of their rapid work was done with special films and intensifying screens which reduced the sharpness of the resulting shadows, and which were unusual and inconvenient to handle. Dr. Henry Hulst, of Grand Rapids, Michigan, repeated the work of Von Ziemsen and Rieder and very soon improved upon it by discarding entirely the intensifying screen and special films.

The radiography of such soft tissues as are found in the lungs presents a different problem from the study of hard tissues such as bones. In a book on the subject published by Saunders & Co., in 1901, the writer pointed out that, contrary to the ordinarily accepted view, soft tissues could be shown best with rays of highest penetration and hard tissues with rays of low penetration. This statement was amply confirmed by Dr. Hulst, and he has recently made his name preëminent in the Roentgen ray examination of the lungs by applying this principle with the aid of an exceedingly large and powerful influence machine built especially for the purpose.

There is some difference of opinion as to how much reliance can be placed in radiographs of the lungs. The thing most desired is to demonstrate whether or not tuberculosis is present before it can be detected by physical signs or laboratory methods. The accomplishment of this is made difficult by the fact that radiographs of nearly all adults show traces of tuberculous foci which have become encapsulated and calcified. By repeated examinations with the fluoroscope and the photographic plate a fairly accurate idea may be obtained as to whether the disease is active or not. The first examination will very often show areas of consolidation or even cavities which have not been demonstrated by careful physical examination. Much valuable information can be obtained in this way, but the claims of some of the enthusiastic workers in this field are a little extravagant. In all plates such as we obtain of the thoracic region, there are innumerable shadows which may easily be interpreted to fit a preconceived diagnosis.

Much useful information concerning the gastro-intestinal tract may be obtained by *x*-ray examination after feeding a meal containing a bismuth salt, which is opaque to the *x*-ray. The size, shape, and position of the stomach can be readily shown. Its motility may be estimated by the length of time it takes for the bismuth meal to pass into the intestines. Strictures or other obstructions in the tract may ofen be demonstrated. In some cases a malignant tumor pressing against the stomach wall changes its outline in such a way as to excite suspicion. Much excellent work has been done in this field by Dr. Hulst, of Grand Rapids; Crane, of Kalamazoo, and Pancoast and Pfahler, of Philadelphia.

One of the more recent and one of the most difficult applications of the *x*-ray is in the examination of the accessory nasal sinuses. The frontal sinuses are subject to exceedingly great variation in size and shape in different individuals. Asymmetrical sinuses occur frequently and render diagnosis by ordinary transillumination uncertain. A good set of radiographs will enable us not only to demonstrate the size and shape of the frontal sinuses, but usually to ascertain whether pus is contained in them or in the ethmoid cells or in the maxillary sinuses.

In the study of fractures, dislocations and bone diseases, faulty development of the teeth and diseases of the alveolar processes, the Roentgen ray is so well known that only passing mention need be made of it. The success of radiography in such work as this has long been recognized. The results obtained in this, which is the comparatively easy work of roentgenology, have been materially improved by the use of elaborate accessory appliances, by stereoscopic methods, by shortening the exposures, and by a better knowledge of how to interpret the shadows of certain pathological conditions of the bones.

The use of stereoscopic methods in radiography which was suggested by Elihu Thompson in 1896, and soon afterward put into practice by Mackenzie Davidson, has proven of great value in such work. Unfortunately the technic of stereoscopic radiography is a little tedious and few roentgenologists have availed themselves of its advantages. In examinations for urinary calculi when phleboliths or other extra-uninary bodies produce confusing shadows the stereoscope is valuable in determining their space relations, especially when the ureter is outlined by a styletted ureteral catheter.

Although brilliant radiographs of wrists, hands, elbows and teeth may be made by almost any amateur, the successful use of the *x*-ray for diagnosis in the thicker parts of the body and especially in the urinary tract, the gastro-intestinal tract, the thorax and the nasal sinuses has been attained by comparatively few men who have spared neither pains nor expense in perfecting their technic. The very great difference in the cost of making an *x*-ray examination of a simple subject like a wrist or hand and of a difficult one like the gastro-intestinal tract is seldom appreciated. One of my colleagues tells me that his outlay for tubes and plates in such an examination as the one last mentioned averages at least $30 for each case. The roentgenologist of to-day practices one of the most difficult, dangerous and unremunerative of medical specialties, but the stigma of the bell hanger's *x*-ray picture shop still clings to him.

Strangely enough, although there are few if any legal restrictions, the practice of the art by those without medical training has almost died out except in some of the hospitals in our largest and least progressive American cities.

The almost ineradicable impression that the radiograph is a picture or a photograph which anyone may properly examine, interpret and criticize, has been a great hindrance to the progress of roentgenology and to its proper recognition.

The radiograph is, in fact, not a picture or even a photograph, except in the sense that photographic materials are used in its production. It is a special kind of projection and is essentially more like a microscopic slide than a photographic view. Unfortunately, it may so much resemble a photograph that laymen and medical men alike are apt to regard it as a *view* and not suspect how incomplete and even how dangerous their over-confident interpretation of it may be.

The mere operation of an *x*-ray outfit is becoming much easier with improved appliances, but the number and the cost of the necessary appliances have increased enormously. An up-to-date equipment of the best kind for all of the different special applications of Roentgen ray diagnosis will cost from three to seven thousand dollars, and the necessity for adding new apparatus from time to time to replace that which has become obsolete, materially increases the cost to the man who is endeavoring to excel in this very necessary adjunct to medicine and surgery. The roentgenologist who would excel, must provide himself with the best possible equipment. He must acquire skill in the technic of using it. He must be painstaking in his observation of the plates, accurate and not over-enthusiastic

in his interpretation of them. His opinion should be valued rather than his so-called *x*-ray pictures.

Men whose opinions command respect should be placed in charge of the Roentgen ray work in hospitals, and they should be provided with adequate equipment and competent assistants. The extreme degree of economy practiced in the *x*-ray departments of many hospitals occasionally proves dangerous in the end.

The dangers of the *x*-ray, like those of the old muzzle-loading gun, which had neither lock, stock nor barrel, may come from unexpected quarters. Occasionally, a physician may be confronted with the dilemma of fearing to use the *x*-ray lest he burn his patient, and fearing not to use it lest he be liable to suit for malpractice. In reality, although skin lesions are sometimes produced by therapeutic applications of the *x*-ray, their occurrence in diagnostic work has practically disappeared in every laboratory where up-to-date methods are in vogue. There is really more danger in the failure to employ the *x*-ray in appropriate cases than in its application in diagnosis. This is well illustrated by the case which has been freely exploited recently in the newspapers of a patient who had suffered for eleven years from a pair of forceps left in the abdominal cavity in an old surgical operation, and which were readily shown by the *x*-ray years afterward, when the patient was practically moribund.

It is obvious, therefore, that the safest plan is to employ the *x*-ray in appropriate cases, but to be sure that it is skilfully applied. The foregoing remarks are not intended as a eulogy upon the roentgenologist; he has had his troubles, to be sure, but like all mankind he has his shortcomings and has made his mistakes. The mistakes, however, have been an aid in climbing the ladder of experience, and in the promise of the future it is felt that he will, with the coöperation of his colleagues in medicine and surgery, make his work constantly more and more valuable to the healing art and to humanity.

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IMPORTANCE OF OCCULT BLOOD IN THE FECES.

The dark, tar-like stool is symptomatic of duodenal ulcer, but the difficulties in eliminating sources of error in occult blood in the stool are so numerous that less dependence is to be placed upon hemorrhage as a symptom than in stomach ulcer. Differential diagnosis must include a consideration of the possibility of the existence of both duodenal and gastric ulcer in the same patient.—W. D HAINES in *The Lancet-Clinic.*

FIBROIDS AND PREGNANCY.*

CHARLES LYRBRAND BONIFIELD, M.D.,

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Fibroid tumors of the uterus, are said to be the penalty a woman pays for celibacy. All observers agree that they are much more frequently seen in women who have never borne children, than in those who have, and we can safely say that sterility predisposes to fibroids and fibroids predispose to sterility. Fibroid tumors have a tendency to render a woman sterile in three ways. First, the hypertrophic endometritis they produce, renders the endometrium unfit to receive and nourish the ovum. The nearer the fibroid is to the endometrium, the more marked its effect on this membrane. Secondly, they are frequently complicated by, and apparently cause, diseases of the appendages, that prevent conception. Third, they may so displace the cervix that it is not bathed in the seminal fluid during the sexual act.

But as a fibroid may exist without producing any of these conditions and as pregnancy may occur in spite of the presence of one or more of them, the coexistence of fibroid tumors and pregnancy is by no means extremely rare. It is probably more frequent now than formerly, for women are marrying later in life, thus putting off their child-bearing until they have reached the age when fibroids are prone to develop.

Pregnancy, by the physiological hyperemia of the uterus to which it gives rise, usually causes fibroids to grow rapidly. During the process of involution, following the normal termination of pregnancy, fibroids may decrease in size very perceptibly. Cases have been reported where they have entirely disappeared. I can not recall a case coming under my observation, where the shrinkage after pregnancy has been commensurate with the growth during pregnancy. Decrease in the size of fibroids after pregnancy is neither sufficiently constant nor sufficiently marked to justify one in recommending pregnancy as a therapeutic measure to a woman who has a fibroid. Fibroid tumors may have little or no effect on pregnancy, or labor may give rise to the most serious complications. Submucous fibroids may cause the premature expulsion of the ovum. This is especially apt to occur if the ovum is implanted immediately over the fibroid, for in such a case the seed has not fallen on good ground.

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* Read before the Southern Surgical and Gynecological Association, December, 1908.

The danger of infection after abortion is great in these cases. The low vitality of the fibroid renders it unable to resist invading germs and the uterine contractions may so interfere with its blood supply as to cause it to slough. The following case was of this character.

The patient was the wife of a physician. She had miscarried at about the fourth month. A large submucous fibroid became infected. When I saw her, her temperature was 105° and her pulse 140. I did not think she would survive a hysterectomy. The tumor was therefore removed by morcellement, but the patient succumbed in a few minutes after being removed to bed.

Pregnancy may go to term and labor may be normal, but followed by severe hemorrhage, the fibroid acting as a foreign body in the uterus and preventing normal contraction and retraction of the muscular fibers.

The efforts of the uterus to expel the fibroid may be successful, as in the following case.

The patient was seen in the summer of 1886 with Dr. G. of Norwood. I was asked to see her 48 hours after delivery, because the doctor believed he had an inversion of the uterus to deal with. I agreed with his diagnosis and made an effort at reposition which, being unsuccessful, an anesthetic was administered. I then recognized that the "inversion" was a fibroid polypus, which had been expelled from the uterus and vagina. The pedicle was about the size of an index finger and was attached a short distance above the internal os. I rotated the tumor to twist the pedicle and then severed it with a pair of scissors. There was no hemorrhage and the patient made a prompt recovery.

There is danger in such a case if the fibroid be attached near the fundus, that inversion may follow the expulsion.

If a fibroid of the uterus has developed between the folds of the broad ligament, it may prevent the uterus rising into the abdomen as pregnancy advances, and give rise to symptoms so severe as to demand immediate surgical relief. A case of this kind is the following.

Mrs. R. was brought to my office by her family physician, Dr. Loomis, of Independence, Ky., who told me that he believed she was pregnant and that she had a large tumor. On examination I found a tumor filling the pelvis and extending above the umbilicus. The patient's left leg was swollen to twice the size of the right. I was unable to reach the cervix and could form no opinion as to the probability of pregnancy. Dr. Loomis and the patient both said the tumor had almost doubled itself in size in four weeks. I performed a supravaginal hysterectomy. She was three and a half or four months pregnant. The tumor had developed in the left broad ligament and far down behind the uterus and vagina. In lifting it out of the pelvis a large hole was torn in the rectum. This was repaired with chromicized catgut. The iliac vessels were uncovered for a considerable distance, but fortunately were not torn. The abdomen was closed without drainage. The recovery was uneventful.

A fibroid tumor springing from the lower part of the uterus, may so fill the pelvis, as to prevent the passage of the child either prematurely or at term. I have had two such cases.

Mrs. J. entered Christ's Hospital on May 13, 1900, on the obstetrical service under the care of Dr. L. S. Colter. She was five months pregnant and was having severe labor pains, but the head was unable to engage, and Dr. Colter seeing that delivery could not be effected asked me to see the case. We decided at once on surgical intervention and I performed abdominal hysterectomy. The patient left the hospital well, June 14th.

On the night of October 25, 1902, I was summoned to see Mrs. T. D. in consultation with Drs. Richards and Schoolfield. I reached the bedside about 2 A. M. and found that the patient had been in labor eight hours. She was 32 years old, the mother of two children, the youngest of which was 14 months of age. She had been delivered of this child in New York and while the labor was tedious, lasting 26 hours on account of an early rupture of the membranes, the use of instruments was not necessary and the physician in attendance made no mention of anything abnormal to the patient or her family. When Dr. Richards was called at the beginning of labor, he found a large fibroid filling the hollow of the sacrum and obstructing the pelvic inlet to such an extent that he believed delivery per *vias naturales* to be impossible. He called in consultation Dr. C. B. Schoolfield, who verified the diagnosis and expressed the same opinion as to the possibility of delivery. I was asked to see the case for the purpose of doing a Cesarian section, if my opinion coincided with theirs. We placed the patient under an anesthetic to make a more careful examination and ascertain whether it were possible to lift the tumor out of the pelvis. We found this could not be done and advised immediate removal to the hospital for operation. The operation was performed at 7 A. M., about twelve hours after the onset of labor. The labor pains had been strong and the os was well dilated, but the head had not even begun to engage in the pelvis. A Cesarian section was done in the usual way and a well developed female child was delivered which still lives. The tumor was attached very low down on the posterior wall of the uterus. Its removal would apparently demand a panhysterectomy and I thought this would add much to the gravity of the operation. I therefore deemed it wise to wait to see what effect involution might have on the tumor, hoping a myomectomy might then be possible. The patient reentered the hospital and a panhysterectomy was done June 7, 1903. The fibroid had grown rapidly and had so filled the pelvis that she was unable to empty her bladder. After the abdomen was opened it was lifted out of the pelvis with difficulty. Gauze drainage through the vaginal fornix to control oozing. Prompt recovery.

Subperitoneal or interstitial fibroids that are interfering with pregnancy or promise to interfere seriously with delivery may be removed by myomectomy. Numerous cases have been reported where the operation was successfully done without the interruption of pregnancy. Only one such case has come under my observation.

I assisted Dr. E. W. Mitchell in this operation June 12, 1889. The patient was a primiparous mulatto, in the fourth month of gestation. A fibroid tumor attached low down on the posterior wall of the uterus almost filled the pelvis and caused a great deal of discomfort. All efforts to push the tumor out of the pelvis were futile. The abdomen was therefore opened. The tumor was found attached by a comparatively small pedicle. This was ligated and the tumor removed without difficulty. Recovery was uneventful. Dr. Mitchell induced labor at seven and a half months for pelvic deformity and the child was still-born. The patient has not again conceived.

Myomectomy should usually be limited to those cases in which the tumors are not numerous and are easily accessible. In spite of the reported successes of myomectomy, one can not expect the uterus to withstand too much traumatism without rebelling. The part of the uterus from which the tumor springs is important. The fundus or the upper part of the body and near the median line are the most favorable locations. Near the tubes or cervix the hemorrhage is more troublesome, necessitating more manipulation. In fleshy women with thick abdominal wall, it is especially difficult to enucleate fibroids down near the cervix with the dexterity that is necessary to success. Long deep incisions into the uterine walls must weaken them and render rupture at the time of labor possible if not probable. Most if not all the reported cases of myomectomy during pregnancy have been done within the first five months. Certainly the cases in which it would be justifiable are rare. After the uterus has risen well out of the pelvis, the tumor is not apt to produce unbearable symptoms and it is often surprising how Nature is able to place it during the later months of pregnancy, so that it will not interfere with labor. Bearing this fact in mind and knowing if Nature fails to accomplish this feat, he can come to her help and with a Cesarian section or Porro operation save the child as well as the mother, the surgeon can well afford to await developments.

Fibroid tumors may be the cause of extrauterine pregnancy. Dr. Gillette of Toledo exhibited at the last meeting of the American Association of Obstetricians and Gynecologists, a beautiful specimen of extrauterine pregnancy removed about two months after missed labor in which a small fibroid occluded the uterine end of the tube and was the evident cause of the condition. Noble reports six cases of ectopic pregnancy complicating fibroids.

In come cases it is evident from the beginning of pregnancy that it will be impossible for it to proceed until the child is viable. Under these circumstances the life of the child must be disregarded. Such a case was the following:

Miss L. was referred to me May, 1908, on account of a very large multinodular fibroid which filled the pelvis and extended above the umbilicus. I advised immedidate operation, but did not see her again until September when she reported for operation but told me she had missed two menstrual periods and admitted there was a possibility of pregnancy. The cervix was pushed up so high behind the pelvic arch that it could not be palpated and I could form no satisfactory opinion as to the existence of pregnancy. I performed a supravaginal hysterectomy at the Good Samaritan Hospital September 8th. After the operation the uterus was opened and a three months pregnancy was found.

The number of cases which should be properly treated in this way is small. I believe surgeons inexperienced in abdominal surgery and obstetrics are either prone to overlook pregnancy as a complication of fibroid or overestimate the importance of fibroids near the fundus as a complication of pregnancy, for in recent years I have seen more than one specimen of pregnant uterus which has been removed on account of the pressure of a fibroid, where the proper treatment would have been delivery at term and a myomectomy some months later. In the following case I first attempted myomectomy but on account of technical difficulties abandoned it for hysterectomy.

I saw Mrs. S. in consultation with Dr. Carlton of Latonia. She was just recovering from an attack of gall stone colic of which she had been an occasional victim for several years. She was 35 years old and the mother of three children. I advised her to enter the Good Samaritan Hospital for surgical treatment. The day before her operation she asked me to make a pelvic examination as she recently had had a great deal of discomfort in that region. I readily discovered two fibroid nodules near the cervix, but on account of her being one of the fleshiest women I have ever treated I was unable to diagnose a three months pregnancy that existed. The patient extracted a promise that I would do all the surgery that I found indicated when the abdomen was opened. After removing a large number of gall stones and establishing drainage for the gall-bladder, I closed the wound and made another incision to deal with the pelvic condition. I at once recognized a large pregnant uterus with a number of fibroids near the cervix, one of which was between the folds of the broad ligament. The location of the tumor

and the great thickness of the abdominal wall rendered their enucleation exceedingly difficult and I soon saw that it would unduly prolong the operation to persist in my efforts, and I did a supravaginal hysterectomy instead. The convalescence of the patient was prolonged by some infection in the fat of the lower incision, but she made a good recovery. I should have displayed better judgment had I left the uterus undisturbed until the end of pregnancy and delivered by Cesarian section.

These cases reported are all that have come under my care in which fibroid tumors have made surgery necessary during pregnancy. The cases I have seen in which surgery was not required are more numerous.

APPENDICOSTOMY.

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We are indebted to Robert Weir of New York, for having pointed out a new and accessible route, by means of which we are able to irrigate the whole of the large, and part of the small intestine, and thus control a tract of mucous membrane that is subject to infection, ulceration and new growths, without subjecting the patient to the risk and inconvenience that attends a cecostomy or colostomy.

Especially is this so on the right side, where leakage of chyme is almost certain to result in loss of flesh and strength to the patient. The observations of Sir William MacEwen prove that "when the opening has been made toward the distal end of the small intestine of sufficient magnitude to allow chyme and intestinal secretions to escape freely the patient suffers from inanition. In marked contrast to this is the condition of the patient affected with an opening in the descending colon near the sigmoid flexure. He does not lose weight; on the contrary, health and strength are maintained and he is capable of carrying out his usual vocation with vigor. These facts go to prove that the entire nutriment obtainable from food is not removed during the passage through the small intestines, otherwise there would be no perceptible loss when the chyme is removed at the end of it; where as it is only when the chyme is allowed to pass along the whole length of the large intestine as far as the sigmoid flexure that the patient derives the full good of the digested matter."

It is now six years since Weir's article on appendicostomy first appeared. In the meantime, observation and a wider experience have enabled us to perfect the technic and arrive at a definite conclusion as to the value of the operation as a surgical procedure in the following conditions:

(1). As a means of artificial feeding.

(2). In cases of ulceration of the large intestine.

(3). In amebic dysentery, with the object of reaching the source of the trouble by means of irrigation.

(4). To prevent distention of the large intestine, following operation.

(5). As a means of introduction of nourishment.

(6). To drain the intestine, in case of obstruction of the large intestine.

(7). To relieve mucous colitis, due to reflex appendiceal conditions.

(8). As a substitute for cecal colostomy.

(9). As a means of irrigating the small intestine.

Preparation of the Patient.—The patient is advised to enter the hospital three days previous to the day set for operation, in order that suitable preparations may be made. This we believe to be wise, as Combe of Switzerland, points out that when calomel is given the toxines that are stored up are set free in the intestines, and, as a result of absorption, there is an increase in the sulpho-ethers in the urine; consequently, a rise of temperature. He advises that the kidneys be given a chance to get rid of the toxines before operation is attempted. The first night the patient is given calomel and soda in broken doses, ¼ grain every fifteen minutes until six doses have been taken, followed the next morning by saline, preferably magnesium sulphate. This is followed by saline enemas, in order that the lower bowel may be thoroughly emptied and to relieve the patient of any straining following the cathartic. For the next thirty-six hours a diet consisting of yolk of egg, boiled rice and milk, soups, toast, a cup of tea or coffee is advised. The morning of the operation the patient is given only a cup of black coffee or tea. By following this regimen we hope to avoid fermentation and save the patient a good deal of suffering later on.

Preparation of the Field of Operation.—Twenty-four hours before operation a soap poultice is applied to the abdomen; this is allowed to remain in place for twelve hours, when it is removed and the abdomen washed off by means of a piece of gauze saturated with ether; this is followed by sterile water and alcohol applied in the same manner. An ointment of oleate of mercury is now substituted and allowed to remain in place until the patient is under the anesthetic, when it is removed and the skin scrubbed with tincture of green soap, using a piece of gauze to do the scrubbing; the surface is then sponged with ether, and finally with alcohol.

We believe that shock would be lessened, and the anguish and dread caused by the idea of an anesthetic would be minimized, if previous to all operations the patient were given an injection of $^1/_{100}$ of a grain of hyoscine and ¼ of a grain of morphine, three hours before the time set for the operation. If advisable, and only under the supervision of the operator or his trained assistant, a second injection, consisting of hyoscine and morphine in a dosage consistent with the patient's tolerance may be administered. We have followed this procedure in a number of cases and have found it entirely satisfactory. The patient has no recollection of being taken to the operating room; the quantity of the anesthetic required to complete the operations is very small, and, as a consequence, the disagreeable after-effects are eliminated.

The Modern Operation.—The patient having been prepared as previously suggested, the location of the appendix is ascertained, if possible. In some the appendix is found directed down over the brim of the pelvis and can sometimes be felt through the rectum. In such cases the incision should be made low down in the abdomen; otherwise, the McBurney or Kammerer incision is employed. The length of the incision should not exceed an inch and a half.

When the abdomen is opened the cecum can easily be found, and, by following the anterior band, the appendix is reached and brought forth and the appendiceal artery ligated close to the first branch that is given off to the appendix. It is important to observe these precautions, as this branch anastomosis with the appendiceal branch of the cecal artery and furnishes a good blood supply to the root of the appendix. The meso-appendix is now stripped off, and any bleeding points presenting themselves ligated. The cecum, about one-tenth of an inch from the appendix, is next sutured to the peritoneum. This precaution is observed so that if, by any chance, the appendix is perforated in an effort to introduce the catheter afterward, the perforation will be extraperitoneal. The fascia is now closed by means of interrupted sutures, care being taken not to suture it too snugly around the appendix; otherwise strangulation might occur at this point and complications follow. The appendix should then be held by an assistant and sutured to the skin by means of two lateral sutures to prevent it receding into the abdomen. The skin is approximated on either side of the appendix by means of two continuous No. 2 plain catgut sutures, and finally the wound is sealed by means of cotton and collodion. Care must be taken that the collodion does not flow around the appendix and strangulate it. Afterward the appendix is wrapped in a piece of rubber tissue and a gauze dressing placed over all, held in place by means of adhesive plasters, thus completing the operation.

On the third day subsequent to the operation, the appendix is opened by removing that portion above the level of the skin. No anesthetic is required for this procedure, which is not painful. Contrast this with a case in which the mesentery was allowed to remain intact. Immediately the appendix was handled the patient complained of pain radiating up to his umbilicus and then into the epigastrium, increasing in intensity; and, as the mesentery was cut and handled the patient became pale, nauseated, a cold perspiration covered his face, and he was returned to bed, suffering from severe shock.

Normal Salt Solution Through the Catheter.—The solutions to be used for subsequent irrigation depend on the condition for which the appendicostomy is performed. If it is to be used as a means of artificial feeding, the patient suffering from some gastric trouble, then a suitable nourishment is administered. It is, however, well to know that a fair percentage of fats are absorbed in the cecum, as pointed out by Sir William MacEwen. This statement may be questioned on account of the absence of villi in the large intestine; but if we remember that Lieberkuhn's follicles are really inverted villi, we can more readily see how this is possible. Moreover, we believe it is probable that under certain conditions those inverted villi which ordinarily absorb a certain percentage of the fats may, by some wise provision of nature, be capable of increasing their capacity. In one case of Tuttle's, where an artificial anus had to be made on the right side near the ileum, for multiple adenomata in a child, by all preconceived and accepted ideas the child should lose weight, and I believe would have, were it not for the fact that he was systematically fed on emulsified fats. Now, one year later, the child has gained about ten pounds and is, so far as we can see, cured of his adenomatous condition. For this reason we are inclined to agree with the surgeons who advocate this operation as a means of artificial feeding. Keetley has employed it to relieve obstinate constipation; to fix the cecum in cases of intussusception of the ileum, and as a substitute for colostomy. We have had no experience with the operation for the conditions named by Keetley.

We do speak, authoritatively, however, of its value in amebic dysentery, as the majority of cases where we have employed this procedure were for the

relief of this condition. As each and every papular ulcer that we see in the intestine contains one or more amebæ, which, when the mucous membrane ulcerates, sets free several young amebæ, these, being free in the intestine, penetrate at some other point in the gut forming one or more colonies, thus multiplying and forming fresh foci. For this reason, washing out the intestines and removing the young colonies faster than they are produced will bring about an improvement which, if persisted in, will eventually cure. In other words, we believe the cure of the patient by irrigation to be purely a mechanical process. Other men have had equally good results with solutions of quinine, copper, krameria, etc.; but if what we state is correct, then a normal salt solution is sufficient. The disadvantage of using medicated solutions like quinine, copper and so on, is that they frequently cause very disagreeable toxic symptoms.

The question may be asked—Why should not high colonic irrigations produce the same results? Because, first, the current is *vis a tergo;* secondly, very few patients readily tolerate taking high rectal injections and will not continue the treatment for any time, for, owing to the sensitiveness of the intestine, spasmodic contraction takes place, causing acute pain. Again, rectal irrigations, simple as they are, require a degree of skill not possessed by all patients. Assuming, however, that patients are willing to put up with the discomfort, and granting that they will carry out the treatment, it is doubtful if in many cases the cecum is reached. In comparatively few cases have amebic ulcers been found higher than the cecum; if the ileum is suspected, it can be reached through the appendiceal opening and washed out, but not by high colonic injections.

Technic of Irrigation.—For the first few days after the appendix has been opened, the bowel is irrigated with a pint of normal saline solution, once a day at temperature of 70°. Gradually the quantity introduced is increased until a quart is reached; this is the capacity of the majority of individuals. If the case is a severe one, a smaller quantity should be used for fear of over-distention, and the possible perforation of an ulceration. It is better in such cases to use a pint at a time, and irrigate twice a day. If copper is preferred, a solution of $^1/_{5000}$ is generally used, the patient being carefully watched for toxic symptoms.

Experimental work by Musgrave, in Manila, has demonstrated that the temperature of the solution does not affect the vitality of the ameba; and that the idiosyncrasies of the patient with regard to temperature should be consulted, and his comfort thus increased. Nevertheless, by causing the amebæ to to become encapsulated we believe they are more easily removed, and for this reason, if the patient can stand it, we prefer a cold solution. If an astringent is necessary, then a solution of krameria in the proportion of a tablespoonful to a pint of water answers the purpose.

The post-operative treatment, which is curative, should be most carefully carried out according to the lines above suggested. It should be persisted in for a number of months after the disappearance of the symptoms, because it has been found that amebæ may be resuscitated, by giving a dose of magnesium sulphate as a test after the patient is apparently sured.

In catarrhal conditions a 2 per cent. solution of ichthyol may be given with good results. If it is necessary to use some other solution, the following will be found serviceable: Nitrate of silver, $^1/_{5000}$; solution of hydrogen peroxide, 15 to 20%; aqueous fluid extract of krameria, 10%.

In case of multiple adenomata, we have found radium water most efficient. If this cannot be obtained, krameria, or some other astringent should be used.

Washing out of the small intestine was first suggested by Keetley and carried into effect by Sir William Bennett and William Ewart (*Lancet,* May 12, 1906, page 1311). Drs. Ewart and Bennett first worked out the technic on the cadaver, and afterward successfully put it into effect on a case of Ewart's. Quoting from the report: "Skiagrams were taken later, which showed one catheter lying in the ascending colon, and the other in the small intestine passing across from the right side of the small pelvis, across the middle line, till the point was lost about the brim of the true pelvis on the left-hand side." The modus operandi, as described by Ewart, is as follows: The catheter is bent (not too sharply) to about 110° at a point two and one-half inches from its tip. It is to be introduced not sagittally, as when it is intended for use in the cecum, but inward and downward as well as backward, in the direction of the nearest spot on the brim of the pelvis. The assurance that the catheter has entered the small intestine is given by the greater length introduced (maximum, in case of Ewart, nine inches), by the subjective sensations of the patient experienced in the hypogastrium even so far as the middle line, by the direct palpation through the abdominal wall sometimes obtained by the operator and by the skiagram of the stillette *in situ.*"

Shortly after reading Ewart's paper, the writer had several cases of amebic dysentery, on which he

performed appendicostomy, with the object of irrigating the large bowel. Six of the eight cases thus operated upon promptly yielded to this treatment. Two, however, remained intractable, and on these it was decided to try Ewart's method, especially as the writer remembered that the entameba dysenteria sometimes invades the small intestines. The technic of Ewart was not wholly followed, but this is of no importance, except that if difficulty is experienced in passing the catheter as advised by Ewart, the plan used by me might be helpful. The appendix was gradually dilated and a good sized urethroscope passed, electrically lighted, into the cecum, and through this instrument was passed a catheter into the small intestine. Then the urethroscope was withdrawn allowing the catheter to remain *in situ*, the intestines were irrigated with a solution of normal salt.

Closure of the Appendix; When and How.—In amebic dysentery, we are in the habit of allowing the opening to remain for at least a year and a half; by so doing there has not been a single recurrence in the twenty-seven cases reported by James P. Tuttle and the writer. In mucous colitis, with or without ulceration, multiple adenomata, and all other conditions for which this operation has been suggested, the opening is closed three months after the subsidence of all symptoms; or the cure of the condition, if done to relieve some mechanical obstruction; if used as a means of artificial feeding, it is closed after it has outlived its usefulness.

Complications.—Herniæ occurred in two cases, but as they were small, they caused very little inconvenience. When the time came to close the opening, it was decided to exsect the appendix and repair the hernia at the same time. The technic decided on in these cases was as follows: The opening of the apendix was first cauterized with a Paquelin cautery; an incision was made around the appendix and the organ isolated so as to permit its being clamped and its stump burned off. The operation was then proceeded with in the usual manner, the appendix being clamped close to the cecum, cauterized and inverted, and finally buried with Lembert sutures. Primary union and cure of the hernia resulted in both these cases.

Pain over the left hypochondrial and splenic regions is a common complication following amebic dysentery. It persists for a long time and does not disappear until long after all symptoms of dysentery have subsided. This we believe to be due either to the fact that ulcerations in this region are slow to heal, owing to a mixed infection, or to the accumulation of gas and fecal matter. Pain around the opening of the appendix occurs from time to time, due to little papules of granulation tissue; but this can easily be relieved by removing the cause, using either the curette or nitrate of silver.

Difficulty in Reintroducing the Catheter—Difficulty is sometimes experienced in reintroducing the catheter, owing to a spasmodic closure of the sphincter, which guards the opening between the cecum and the appendix. This can be best overcome by gentleness, patience, and possibly the injection of a small quantity of warm olive oil previous to passing the catheter. It is both unnecessary and dangerous to use any force, for the appendix might then be perforated and an abscess, or possibly peritonitis result. If an abscess should follow faulty catheterization it should be promptly opened.

Difficulty in Closing the Opening.—After the appendix has remained open for a year or more, there is sometimes trouble in closing the opening, especially if a large catheter has been used and kept in place for any length of time. This is due to the gradual destruction of the mucous membrane and its replacement by connective tissue, a fecal fistula resulting. Curetting the fistula with an ordinary ear curette and injecting either ichthyol or iodoform, mixed with simple cerate, should bring about healthy granulation and gradual closing of the opening. Should this fail the opening can be closed by removing the appendix as previously advised.

Prolapse of the mucous membrane of the appendix occurs in a small percentage of cases. This can easily be remedied by inserting a plug to keep it in place, or by cauterizing the mucous membrane with the actual cautery or with nitrate of silver. Care must be taken, afterward, that stricture does not follow this procedure.

Prolapse of the cecum through the appendicostomy fistula is a rare complication. One case has been reported by Willy Meyer (*Annals of Surgery*, May, 1908, page 808). If prolapse of the cecum occurs only after the opening is no longer essential, the prolapse can be excised and the bowel sutured, as suggested by Willy Meyer; or the appendix may be removed as in the event of hernia.

One of the complications I have noticed following this operation (especially where the appendix has been dilated and the mucous membrane traumatized, or where there is some superficial suppuration around the appendix) is enlargement of the superficial lymphatic gland above Poupart's ligament. However, this usually subsides in a few days, after appropriate dressings have been applied.

Most watchful supervision is necessary when medicated solutions of high toxicity are used, be-

cause, first, a large area of bowel whose principal function is that of absorption, is exposed to the solution; second, because absorption of toxines and drugs occurs more readily from an ulcerated than from a normal mucous surface. Even a solution of salt, if not properly prepared, is apt to work injury to the patient. In this connection we would mention that $^{9}/_{10}$ of 1% is isotonic with human blood and it has been pointed out by physiological chemists that any deviation from the normal causes a destruction of the blood cells. The importance of this cannot be overestimated. In one case, owing to the carelessness of the nurse, a concentrated solution from stock was used and caused pronounced shock. We would, therefore, urge those who have not the facilities for preparing the solution, to keep on hand tablets which, when added to a certain quantity of sterile water, give an absolutely reliable solution.

When diarrhea and the passage of blood continue, after all amebæ have disappeared from the stools, examination of the rectum and sigmoid should be made to see whether polypoid growths, either adenomatous or papillomatous exist. They are generally confined to the rectum and sigmoid and can be readily seen through the proctoscope, and then removed by means of the snare or cautery.

The danger of liver infection, in case the appendix is involved, has been put forth by Musgrave as an objection to this operation. We will admit that the appendix is involved in a good many cases of amebic dysentery; but we believe the danger of liver infection, following operation, is usually more imaginary than real.

Objections to the Operation.—The danger attending the opening of the abdomen is, of course, the main objection; but there is less danger in the procedure than there is of liver infection if the disease is allowed to run riot. Furthermore, this operation (unless contraindicated by some kidney, heart or lung complication) should have no mortality, other than that of the anesthetic, if all the rules of surgical technic are carefully observed.

28 WEST 50TH STREET.

"OPEN ULCER" HEMORRHAGE.

The danger of hemorrhage is ever associated with the presence of an open ulcer. It may be slight capillary oozing or more free bleeding from venous or arterial trunks. Erosion of a vessel in the wall of an old indurated ulcer is apt to be fatal on account of the fact that the vessel walls are held as by a vise, preventing collapse or retraction and clot formation.—JOHN B. DEAVER in the *Therapeutic Gazette.*

Surgical Suggestions

An intractable non-gonorrheal cystitis in the male nearly always indicates a tuberculous kidney. —H. N.

When a pyloric carcinoma is palpable, preoperatively radical removal is usually impossible—H. N.

The examination of the eye grounds will often be the first clue to a tumor of the brain.—H. N.

When draining a deep-seated abscess found with an aspirator, do not remove the aspirating needle until the abscess has been freely opened. (It is allowable to replace the needle by a grooved director).—H. N.

Osteosarcoma about a joint may closely simulate a rapidly-growing exostosis of arthritis deformans. — H. N.

X-ray shadows of renal calculi very close to the vertebral column should make one suspect stones in one half of a horseshoe kidney.—H. N.

Not infrequently shifting dulness in the flanks is the only differential signs between diaphragmatic pleurisy (and beginning pneumonia) and appendicitis.—H. N.

Rectal palpation is an essential part of the examination in most acute intraabdominal affections.

Peristalsis from left to right, visible through the upper abdomen, is indicative of pyloric obstruction.—W.

To develop manual dexterity nothing is better than the practice of tying surgical knots.—H. N.

Not only in the abdomen but everywhere else in the body—with the sole exception of the brain—when in doubt, drain!—H. N.

For the diagnosis of fractures of the upper end of the femur careful measurements are often of greater value than any manipulations—and much safer.—H. N.

When a patient with inflamed varicose veins develops suddenly dyspnea and cyanosis, don't sit her up to examine her—the probability of pulmonary embolism is too great.—H. N.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, SEPTEMBER, 1909.

THE CONSERVATIVE TREATMENT OF INTESTINAL OBSTRUCTION.

This editorial is inspired by the fact that the writer has seen not a few lives sacrificed upon the altar of complete and perfect technic in treating intestinal obstruction, when a cure would have been possible had the surgeon been willing to do less. For example, in a case of gangrene of the sigmoid from volvulus, having done his resection the surgeon is prone to proceed with an anastomosis of the bowel. The temptation to do a complete and perfect operation is very great. A successful operation is often done; but the patient dies. Better success is secured if the bowel ends are rapidly brought up into the wound and fastened there. Then with a living patient the surgeon may in his own good time and convenience apply such measures for the cure of the artificial anus as the circumstances indicate.

We begin an emergency operation with a mental consciousness that the operation is of emergency. Without surgical relief the patient will perish. But at a certain stage in the operation the condition ceases to be one of emergency. The lethal conditions have been relieved or overcome. Then it is that the wise surgeon changes his mental attitude in the very midst of the operation. He ceases to think of his patient as possessed of a fatal disease, but as one with a good chance for recovery if it is but given to him.

During operations for resection of the colon for cancer, it is not infrequently observed that the chronically ill patient begins to show depression. That is the time for the surgeon to dismiss from his mind all ideas of a completed and perfect operation. Let the bowel be fixed in the wound, and let the patient have a chance for his life. An artificial anus is not a pleasant thing to contemplate. It is nasty, and requires much care. Patients who find themselves possessed of one, often say: "I would rather have died than been left in this condition." That is just one of the falsehoods which develop out of the psychology of sickness. This state of mind should not be taken seriously. Let the surgeon be not coerced by it nor intimidated. It is not for the patient to decide anyway. The business of the surgeon is to save life. A patient with an artificial anus can be cured. Moreover, he has the merit of being alive. A patient lying dead, even though his snugly closed abdomen contains a perfect piece of anastomotic work, is not a credit to surgery or the surgeon.

In the treatment of intestinal obstruction there is one major indication: that is to relieve the obstruction. The next step is to empty the bowel of the retained stercoral poison. These things having been done, the emergency has been met, and the surgeon's next duty depends upon the patient's general condition. But to proceed to consummate a classical operation at this stage, when the patient is in the grasp of toxemia and shock, is a reproach to surgery; for surgery is an art as well as a science, and the surgeon should be humanitarian as well as master mechanic.—J. P. W.

JOURNAL DE CHIRURGIE.

Contemporaneous surgical literature, in many languages, is scattered through hundreds of medical journals and society "transactions." For those who would have knowledge of all these publications an index and abstract, published at short intervals, is quite essential. The various year books and quarterlies, and the reviewing departments of many journals present, to be sure, the most important surgical advances, but they are necessarily quite incomplete and for the bibliographer their service is limited. The well-known German weekly surgical review contains no mention of any article not abstracted; and these abstracts are scattered, unsystematized and rather "stale."

To those of our readers, and especially those who read French, who are in search of a thoroughgoing index to, and review of current surgical literature, we would earnestly commend *Journal de Chirurgie*,* now in its second year of publication. This "revue critique," edited by Cunéo, Gosset, Lecène, Lenormant and Proust of the Faculté de médecine

de Paris, presents each month: a classified list of all the surgical, special and general medical journals of record (received since the preceding issue), that contain any surgical articles, and the titles of those articles (in French and in the original); the surgical programmes of societies (one hundred or more) of all the large cities of Europe and America; a list of recently published surgical dissertations and books; an alphabetical subject-index to all these titles; and abstracts of many of these articles, theses, books and society presentations. The abstracts have these notable features: They are grouped under definite headings (technic, general surgical pathology, general therapeutics, cranium and brain, mouth and pharynx, etc.); they are well written; they are in clear type and freely illustrated; to a single subject each month is devoted a broad review by one of the editors. The index, printed on tinted paper, may be removed from the abstracts for separate binding. Opposite each journal or medical society is a marginal number by which it is constantly indexed.

Than this description of its contents nothing more is needed to indicate the value of *Journal de Chirurgie*. But a word of thanks from this side of the Atlantic is due those who have so comprehensively conducted this work. And here we must recall that in the years during which the publication of the *Index Medicus* was suspended, our French colleagues stepped into the breach with *Bibliographia Medica*.—W. M. B.

LIGATION OF THE VEINS FOR PURULENT PYLEPHLEBITIS FOLLOWING APPENDICITIS.

Although many criticisms may be made of Wilms' case of ligation of the veins in purulent pylephlebitis following appendicitis (reviewed on page 312 of this issue) the principle is one to which we would draw attention. With our present treatment, pylephlebitis following appendicitis is a uniformly fatal condition. The organisms are rapidly carried to the liver, and the patient usually dies with the clinical picture of multiple abscesses of that organ. It is not fair to assume from Wilms' report of his case that pylephlebitis *was* present because he had not removed the appendix, nor does he describe the condition of the veins tied off. It is well known, too, that gangrenous appendicitis alone may be the cause of oft-repeated chills. On the other hand it is equally well known that early in pylephlebitis only the small venous radicles of the appendix and and in the mesentery immediately above the ileo-cecal junction are infected.

Theoretically, therefore, the operation might proceed as follows in a case of pylephlebitis: The appendix is delivered in the usual way, but instead of tying off its mesenteriolum the latter is incised step by step to see whether there is any bleeding from the veins. If there is no bleeding the mesenteriolum is divided slowly at a higher level, but one that is safe for proper ligation of any vessels that should bleed. If now there is no bleeding from the veins, the anterior surface of the mesentery is exposed above the ileo-cecal junction. It is incised near the ileo-cecum and stripped upwards to expose the mesenterial vesels. The veins are examined and are treated in the same way as those of the mesenteriolum. The highest level to which one may go without great danger of gangrene of the intestine is about two inches above the upper border of the ileum. If at this level the veins are thrombosed, theoretically such an operation should be abandoned because patients with pylephlebitis are too sick to stand a resection of the ileo-cecal junction in an infected field. Should the operator have the good fortune to find the veins free they should be dissected from the arteries and tied off (at this level, there are from two to four venous trunks into which the venous radicles of the appendix and ileo-cecum empty). The field of operation should be widely drained. Wilms, in this case, mobilized the cecum and ileum, but this would seem to be unnecessary and offer grave possibilities for a retroperitoneal cellulitis.

Any procedure that may improve the chances of a patient who has practically no chance with suppurative pylephlebitis should be most strongly advocated on all sides—thereby a curative procedure may be perfected.—H. N.

BACTERIA IN NORMAL VISCERA.

It has been generally accepted that normal liver, spleen, kidney and blood are free from bacteria. On the other hand, the lungs, mesenteric and other glands of healthy animals may contain bacteria. H. Conradi, of Neunkirchen, (*Muenchener Medizinischer Wochenschrift*, June 29, 1909) has made new tests upon cattle and swine immediately after they were killed, using a special technic which excludes outside contamination. Bacteria were found in nearly two-thirds of all the livers and in one-third of the kidneys and muscle. Of five lungs, four, of four lymph glands, one, and of eleven spleens, one contained microorganisms. Anaerobic bacteria were very common. The types of organism show that the majority belong to the intestinal flora. The number of bacteria were very few. Possibly these experiments, which are to be continued, will throw light upon the relation of trauma and infection.

* Published monthly by Maisson et Cie, Paris.

Book Reviews.

Myomata of the Uterus. By HOWARD A. KELLY, Professor of Gynecology in the Johns Hopkins University, and THOMAS S. CULLEN, Associate Professor of Gynecology, Johns Hopkins University. Royal octavo; 723 pages; 386 illustrations by August Horn and Hermann Becker. Philadelphia and London: W. B. SAUNDERS Co., 1909. Cloth, $7.50; half morocco, $9, net.

The material upon which this volume is based consists of all the cases of uterine myoma operated upon by the Johns Hopkins Hospital staff during a period of twenty years, 1,674 in all. The total mortality was between 5-6 per cent.; for the last 238 cases less than 1 per cent. As this enormous material is discussed at great length, no attempt was made to review the literature. The authors have approached the subject from various viewpoints dealing with the anatomical classifications—uterine, parasitic, cervical, submucous myomata; the pathological—degenerations, calcification, angiomyoma, lipomyoma, adenomyoma, myosarcoma, etc.; associated conditions—of the adnexa, ligaments, bladder and ureter, etc.; symptoms, diagnosis, operative methods, etc., etc. At least a chapter is devoted to each heading.

No other book dealing with the subject approaches this one in wealth of detail, in closeness of observation, in marvelously faithful reproduction of conditions by means of superb illustration. Fully 950 actual cases are recorded more or less fully in the text, thus putting a huge "case-book" at the disposal of the reader.

It is impossible, in the compass of a review, to give even a brief abstract of the contents. A few striking statements may be selected, however. Of the causes of myoma sterility seems important, for of 1,149 women 584 were sterile. "The uterus must have something to do and if it is not kept relatively busy as a result of frequent pregnancies, it may tend to show its activity in another direction, namely in the formation of myomata." Disturbance of menstrual function is never occasioned by a myoma unless the contour of the uterine cavity is altered and the mucosa impinged upon. The authors agree with Leopold that heart changes, if found in myomatous patients, are solely due to the uterine hemorrnages. Myomectomy in 94 patients during the child-bearing period was followed in but 12 by pregnancy. Supravaginal hysterectomy is the operation of choice, but only where the specimen which is at once examined shows no signs of malignant changes.

The excellence of this work is striking, as we have attempted to show by this necessarily brief review; but its deficiencies are equally obvious. There has been no fault of omission (!); on the contrary, by embodying more than 900 histories in the text, the reader is overwhelmed and bewildered by an enormous mass of detail, by a great disproportion between epicritical remarks and casuistic data. Does the description of hyaline and cystic degeneration of myomata warrant the recording of 20 cases? By this very recording of everything seen or found or surmised, the authors defeat their purpose. The general practitioner will much prefer a shorter and more concise exposition, a résumé of the large and valuable knowledge and experience of two such authoritative authors as Kelly and Cullen; the specialist will find pages and pages of case histories such as those with which he is acquainted from his own work. Let us hope that the next edition of this otherwise admirable book will show the effect of judicious but liberal pruning.

Gynaecologia Helvetica, contenant les Comptes Rendus officiels des séances de la Société d'Obstetrique et de Gynécologie de la Suisse Romande. Bearbeitet und herausgegeben von PROF. DR. O. BEUTTNER, Direktor der Universitäts-Frauenklinik in Genf. Octavo; 286 pages; 40 illustrations and 9 plates. *Vol. IX., Part I.* Genf, 1909.

The first 66 pages are occupied by the proceedings of the Obstetrical and Gynecological Society of Switzerland. The volume also contains eight original articles—*Bauer,* A case of placenta previa centralis, with expulsion of the intact ovum (5½ months); *Debrunner,* Perforation of the uterus by the curette; *Guggisberg,* Fetus papyraceus; *Meyer-Ruegg,* Retention of fetal bones after abortion; *Meyer-Wirz,* Pubiotomy; *Stoll,* Galvanocaustic uterine sound; *Perries,* Three cases of accessory mammary glands, and *Rapin,* Michel's clamps. A very careful résumé of important articles from the literature of Switzerland and other countries, fully illustrated, covers more than sixty pages. The articles are mostly in German, a few in French. The volume is handsomely gotten up and contains much valuable material.

Bier's Hyperemic Treatment in Surgery, Medicine, and the Specialties. A Manual of Its Practical Application. By WILLY MEYER, M.D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital; Surgeon to the German Hospital, New York, etc.; and PROFESSOR DR. VICTOR SCHMIEDEN, Assistant to Professor Bier, University of Berlin. *Second Edition,* revised and enlarged. Octavo; 280 pages; 103 illustrations. Philadelphia and London: W. B. SAUNDERS Co., 1909.

What has been said in review of the first edition in the AMERICAN JOURNAL OF SURGERY several months ago applies to this work in its present form. Very few additions to the text have been made—chiefly the insertion of some histories of the more interesting cases. The largest addition is a very extensive index of the literature of the subject, embracing practically everything that had been written on Bier's treatment.

Marriage and Disease. Being an abridged edition of "Health and Disease in Relation to Marriage and the Married State." Edited by PROFESSOR H. SENATOR and DR. S. KAMINER, Berlin. Translated from the German by J. DULBERG, M.D., Manchester, Eng. Octavo; 452 pages. New York: PAUL B. HOEBER, 1909. Price, $2.50.

There is no more valuable service that can be rendered to busy practitioners than to condense large works and make the gist of special information available. The above abridgment has been excellently made. Freed from superfluous technicalities, the broad subject of marriage and disease is presented in a most enlightening, frank, honest manner. Among public health problems one cannot overestimate the importance of disseminating information regarding the hygiene of marriage with reference to the effects upon the potential parents and their progeny. The popularization of sexual information is distinctly within the field of the general practitioner rather than the field of the specialist. The general practitioner, the family health counselor, should be consulted by every man previous to betrothal.

The chapter by Mr. Gruber on the Hygienic Significance of Marriage is well presented. With very little emendation it could be gotten out in the form of a tract to be handed to prospective brides and grooms. It is generally moderate in tone, but lays proper emphasis on the compatibility of good health and abstention from sexual intercourse. The dangers of early and late marriages, rapidly successive births and mortality of illegitimacy are carefully discussed. There are a few over-statements, as for example: "No one is perfectly normal and entirely free from inherited disease," and "we are in essentials the creatures of parents and ancestors predestined by some combination as to what we are to be"; nor is it wise to dissuade from marriage women with poorly developed breasts and hips. Why are not primary and tertiary syphilitics to be excluded from marriage? The chapter as at present written is unsafe for the laity, as it contains much that would tend to loosen the fibres of society, which is hardly prepared to accept marriage on the basis of social physiology. To keep everyone from marrying because of some slight physical, mental or moral defect would be the best stimulus to prostitution.

The chapter on Congenital and Inherited Diseases lacks harmony and is not fully freed from technicality. Turbringer has written a most valuable chapter on Sexual

Hygiene in Married Life. It is frank, conservative, rational and worthy a place next to the marriage certificate. An occasional error occurs, as "lactation makes a woman for the time being sterile." That belief has made many a home unhappy. Neisser's discussion on gonorrheal diseases is well balanced. Lederman has exaggerated the dangers of leprosy, concerning which physicians should give more scientific advice. To call a urethral carbuncle a sort of elephantiasis is quite too hyperbolic.

The treatment of the subject of insanity is very full, too much so even for a doctor contemplating matrimony. The discussions of perverse sexual sensations, alcoholism and morphinism are succinct and suggestive. It is regrettable that an asterisk occurs after the many statements of a morbid, psychopathic nature calling attention to the fact that an appetite for such themes may be better sated by reference to unabridged, unexpurgated work. The question of the economic importance of sanitary conditions in relation to marriage resolves itself into a logical, earnest advocacy of marriage certificates of health for males.

There is little doubt that the work in its condensed form will fill a great need. Education of physicians in the subjects involved in marriage and disease is most necessary; it is not part of the training offered by our medical schools. Welcome to the abridged volume—even without the asterisks.

Atlas und Grundriss der Rontgendiagnostik in der inneren Medizin. Bearbeitet von Beck, Brauer, Groedel, Haenisch, Jamin, Köhler, Krause, Spiess, Steyrer. Herausgegeben von DR. MED. FRANZ M. GROEDEL, Bad Nauheim. Large octavo; 338 text pages; with 114 text illustrations and 297 pictures in 12 photographic and 44 autotype plates. München: J. F. LEHMANN, 1909. Price, 24 Marks.

In the preface Groedel states that the reason for the publication of this book is to be found in the need for a comprehensive treatise on the use of the Roentgen rays in internal medicine adapted to the use of the non-roentgenologist. He and his collaborators have fully succeeded in accomplishing the purpose thus stated.

The work begins with a short chapter on the technics of radiography, in which the various apparatus and methods are briefly but sufficiently described. The only criticism to be made here is the failure of Groedel to mention the American inventor Snook in connection with the "interrupterless" generator or transformer. Whatever may be claimed for Koch and others, the one fact remains that it was the American who first made the apparatus work.

The next main division treats of the examination of the organs of respiration. It is difficult to select from its nine subdivisions any one as of greater merit. Especial reference, however, must be made to the sections on the normal thorax by Groedel, the diaphragm and respiration by Jamin, and on pulmonary tuberculosis by Paul Krause.

Then follows a consideration of the organs of circulation. Here the chapter on the heart, by Groedel, stands out pre-eminently. Both the normal and the pathological heart are exhaustively treated. The text as well as the illustrations demonstrate conclusively what a valuable aid the *x*-ray is in the diagnosis of the various forms of heart disease. One need not criticise too severely the author, who is a master of orthodiagraphy, for his partiality to this method as against teleroentgenography.

In the part dealing with the alimentary tract the chapters on the esophagus by Steyrer, and the gastro-intestinal canal by Groedel, deserve particular commendation for the accurate presentation of the subject. Only the chapter on the liver and gall-bladder, by Carl Beck, of New York, is a disappointment. The Roentgen diagnosis in this field is still in a rather primitive state and no amount of hopefulness as to results to be obtained in the future changes the present aspect. To fill space, Beck provides anatomical and surgical descriptions and illustrations are a-plenty and the history of a gall-stone family is cited. This would all be very well in a treatise on the diseases of the liver and gall-bladder or in a surgical text-book, but it is entirely out of place in a work of this sort.

Haenisch contributes a chapter on the Roentgen diagnosis of the urinary tract which is well written and judiciously illustrated, and Köhler's treatise on the diseases of the skeleton keeps well within the bounds of a medical book a subject that is for the most part surgical.

The appended bibliography is practically exhaustive and of inestimable value to the general practitioner as well as to the roentgenologist.

The reproductions in half-tone and in photographic print are beautiful examples of their respective arts and are highly instructive.

Written in its greatest part by clinicians who have utilized the Roentgen rays in their respective fields of work, the work places a true value on this most modern means of diagnosis. It shares neither the skepticism, born of ignorance, of those who but rarely make use of the *x*-rays in "medical" diseases, nor the enthusiasm of the one-sided specialist who forgets that this is but another addition to our diagnostic armamentarium and no more. The authors repeatedly emphasize that only by a consideration of the Roentgen ray findings, together with all the other clinical data, can satisfactory results be obtained.

Another merit of this book lies in its insistence on fluoroscopy (so little practiced in this country) in all examinations of dynamic conditions of the thoracic or abdominal organs.

It is to be hoped that this or as good a work will before long appear in the English language.

Books Received

Die erste arztliche Hulfe bei Unfallverletzten. Beiträge zur Unfallheilkunde von A. KÖHLER, Berlin. Pamphlet; 44 pages. Berlin: AUGUST HIRSCHWALD, 1909. Price, 1 Mark.

Ueber die Lage des Wurmfortsatzes. Von RHABAN LIERTZ, Unterarzt beim 6. Rheinischen Infanterie-Regiment No. 68, kommandiert zur Kgl. Charité. Octavo; 146 pages; 12 figures and 3 plates. Berlin: AUGUST HIRSCHWALD, 1909. Price, 4 Marks.

Sprains and Allied Injuries of Joints. By R. H. ANGLIN WHITELOCKE, M.D., M.C. (Edin.), F.R.C.S. (Eng.), Honorary Surgeon to the Radcliffe Infirmary and County Hospital at Oxford; Lichfield Lecturer in Surgery in the University. Small octavo; 241 pages; 65 illustrations. London: OXFORD UNIVERSITY PRESS, 1909.

Manual of Therapeutics. Referring especially to the Products of the Pharmaceutical and Biological Laboratories of PARKE, DAVIS AND COMPANY. Duodecimo; 643 pages. Detroit, Michigan, 1909.

A System of Operative Surgery. By Various Authors. Edited by F. F. BURGHARD, M.S. (Lond.), F.R.C.S. (Eng.), Teacher of Operative Surgery in King's College, London; Surgeon to King's College Hospital; Senior Surgeon to the Children's Hospital, Paddington Green. In four volumes. *Volume IV.* Large octavo; 687 pages, 351 illustrations. London: OXFORD UNIVERSITY PRESS, 1909. Price, $10 per volume.

The Psychic Treatment of Nervous Disorders. (The Psychoneuroses and Their Moral Treatment). By DR. PAUL DUBOIS, Professor of Neuropathology at the University of Berne. Translated and edited by SMITH ELY JELLIFFE, M.D., Ph.D., Neurologist to the City Hospital, New York, etc., and WILLIAM A. WHITE, M.D., Professor of Nervous and Mental Diseases, Georgetown University, Washington, etc. *Sixth Edition*, revised. Octavo; 485 pages. New York: FUNK AND WAGNALLS, 1909. Price, $3.00, net.

Progress in Surgery.

A Résumé of Recent Literature.

Ligation of the Veins in Purulent Pylephlebitis Following Appendicitis (*Venenunterbindung bei eitriger Pfortaderthrombose nach Appendicitis*). PROF. WILMS, Basel. *Zentralblatt für Chirurgie*, No. 30, 1909.

Wilms believes that this is the first time the operation was performed. His case, in brief, is as follows: The patient came under observation with a large abscess on the appendix region, and the history of having had two chills in several days. The abscess was drained and two days later the patient began to have chills again. The fourth day after the abscess was drained, after the patient had had four chills with step-like temperature, Wilms exposed the ileocecal region widely and mobilized it by incising the peritoneum on the outer side of the cecum and stripping retroperitoneally with the finger. He then exposed the anterior aspect of the mesenterial vessels by dividing the peritoneum overlying them. The veins were isolated from two small arteries, and were tied off in two small bundles. A drain was carried down to the cecum. The patient suffered no evidence of disturbed circulation in the cecum, had no further chills, and made an uneventful convalescence.

The Basting Suture in Gastro-Enterostomy. J. W. LONG, Greensboro, N. C. *Southern Medical Journal*, June, 1909.

One of the drawbacks to the preformance of gastro-enterostomy by the clamp emthod, according to the author, is the sliding of the mucosa of the intestine upon the muscular coat, so that when the suture is done it is difficult to keep these two coats in apposition. In order to guard against this, the author applies a basting suture through all the coats close to the line of incision. The uniting sutures are then placed so as to include the basting sutures. The latter sutures serve the additional advantage that they prevent hemorrhage. The author has tried this method and is satisfied of its success.

Stenosis of the Pylorus in Infancy. CHARLES L. SCUDDER. *The St. Paul Medical Journal*, May, 1909.

The signs of infantile pyloric stenosis appear unexpectedly. From being perfectly healthy, the child gradually wastes away, dying from what is usually called marasmus on the death certificate. The pathological findings are uniform, namely, a pyloric tumor about the size of the end of the thumb. There are no adhesions. Secondary changes in the stomach occur, such as muscular hypertrophy of the pyloric segment and, at times, dilatation of the rest of the stomach. The signs of the disease are vomiting, constipation, loss of weight, visible gastric peristalsis and a palpable pyloric tumor.

The only treatment is operative. There are numerous methods among which may be mentioned the Loreta operation, *e. g.*, the stretching of the pylorus with forceps which the author believes is dangerous; secondly, pyloroplasty, and thirdly, posterior gastroenterostomy which is the ideal operation.

A Report of One Hundred Cases of Herniotomy in Children, with End Results. H. C. SEAVER. *Albany Medical Annals*, June, 1909.

About 33 1-3 per cent. of all hernias occur before the age of fourteen. This relatively large frequency is explained by the congenital preformation of the sac in most hernias, coupled with the rough-and-tumble activities of childhood, and further by the fact that in early childhood the inguinal canal passes more directly and less obliquely through the abdominal wall than in the adult. The well-known preponderance of hernia in the male sex is due to the more strenuous exertions of this sex. About 25 per cent. of hernial patients quote a family history of this disease. Among the exciting causes of hernia in children may be mentioned whooping-cough, bronchitis, intestinal constipation from injudicious feeding, continual injury, falls from a height, or any factor that tends suddenly to increase the intra-abdominal pressure.

In this way the intestine or omentum is made to seek and enter the congenitally performed peritoneal sac, and the extent to which the contents protrude determines whether the hernia be complete or incomplete. In acute hernia the extent of this protrusion corresponds to the extent of the preformed sac, but in chronic hernia the preformed sac, if not complete, may be made so by the gradual stretching of the sac by the sac contents.

In cases of strangulated hernia, too strenuous efforts at taxis may prove detrimental to the welfare of the child. If the strangulation be of *short* duration, the hernia may reduce itself during transportation to the hospital from the slight joltings incident thereto, or may be reduced by the Trendelenburg position, by a hot bath, or by relaxation obtained by anesthesia. If the strangulation be not thus relieved, herniotomy is indicated. The source of strangulation will usually be found to be a tight external ring, and this may be relieved by several nicks in an upward direction, using a blunt pointed bistoury. If an epiplocele be found, the constricted or gangrenous omentum must be removed. If the intestine be constricted, resection is unnecessary if the circulation of the gut is restored after the application of cloths wrung out of hot sterile water. In the case of gangrene, resection of the bowel and lateral anastamosis is indicated provided there is no perforation with extensive cellulitis. In this instance drainage of the intestine and wound is all that is required. After the infection has drained away, the fistula may be closed and a radical cure of the hernia performed.

The Galvanocautery as a Factor in Peritonsillar Abscess. IRVING WILSON VORHEES. *New York State Journal of Medicine*, April, 1909.

From a knowledge of the etiology and pathology of peritonsillar abscess it is quite obvious that any process, either natural of artificial which seals over the oral openings of the crypts, or which binds the pillars firmly to the tonsillar tissue, prevents drainage and produces in the tonsillar region all the conditions necessary to thorough incubation of retained bacteria. The galvanocautery seals over the crypts of the tonsil and thereby makes a closed cavity which is difficult to open properly. In three cases the pus, when allowed to escape, was very foul and not at all unlike that found in ischio-rectal abscesses. The author thinks that the use of cauterants and so-called "shrinking methods" in tonsillar tissues is often unwarranted, and undesirable. It is probable that the physician would find it wise to limit galvano-cauterization to the small ragged tonsil which lies fairly free in its bed and which is not adherent to its pillars. In any case, one should be careful not to interfere with free drainage from the crypts.

Factors in the Operative Treatment of Pulmonary Tuberculosis. W. WAYNE BABCOCK. *The Pennsylvania Medical Journal*, June, 1909.

An incision over the fifth intercostal space on the right side or the sixth intercostal space on the left side is made from the spine to the posterior axillary angle. The periosteum of the two adjacent ribs is divided and pushed off the bones, and the two ribs resected from very near their insertion to a point near to the posterior axillary border, all hemorrhages controlled, and the pleura opened in the line of the intercostal space. The ribs are now strongly retracted, preferably by a special double retractor. In this way, by the resection of two ribs, not much more formidable than some of the more extensive resections done for the drainage of an emphysema, an opening ten or twelve centimeters in breadth and width is obtained, sufficient to admit the hand into the thoracic cavity, and to permit the visual exploration of the lobes of the lung. If greater room is desired, the ribs adjacent to the opening may be weakened by a narrow-bladed osteotome, fractured and strongly retracted. This may be considered a normal exploratory procedure to be prac-

ticed in pulmonary surgery, precisely as the median exploratory incision is made in abdominal surgery. The mortality of such a simple exploration should not be great, provided the patient's condition is favorable. If feasible, the resection or complete amputation of a lobe of the lung may be performed through this incision, the vessels being controlled at the hilum of the lung, and divided ends of the bronchi occluded, the opening in the pleura closed, and finally the divided muscles and skin.

The dangers of operations for pulmonary tuberculosis include hemorrhage, pneumothorax, emphysema and infection. The hemorrhage of the chest wall is to be controlled by ligatures placed before the pleura is opened. The danger of hemorrhage from separation of adhesions or from the incision in the lung seems to have been greatly overestimated. In the case in which progressively clamping and tying the vessels at the hilum, no difficulty was experienced from hemorrhage when the large lobe was amputated. In opening tuberculous cavities in the lung, if the lung tissue be torn through, usually very little oozing will result, the vessels having been occluded by tuberculous process. The cautery is perhaps rarely, if ever, necessary for the control of hemorrhage. Operative pneumothorax has been especially dreaded, as it is frequently a cause of death in the thoracic operation upon dogs. In man the mediastinal partition is much firmer, greatly decreasing the danger of operative pneumothorax, and in tuberculous persons adhesions and exudates may still further immobilize the mediastinal wall, so that often no serious symptoms are produced by the operative pneumothorax. As a rule, in these conditions I believe that a positive or negative pressure apparatus is unnecessary.

Further Studies on the Presence of the Tubercle Bacillus in the Circulating Blood. RANDLE C. ROSENBERGER, Philadelphia. *New York Medical Journal*, June 19, 1909.

The author has now studied a series of 300 cases of active tuberculosis and has found tubercle bacilli in the blood in every instance. He thus confirms his previous observations upon 50 cases of pulmonary tuberculosis. The technic is very simple: Some blood is drawn from the arm into a little citrate of soda solution to prevent clotting; the blood is then antifugalized or allowed to stand over night; the sediment is spread on a slide and thoroughly laked, and the spread is then stained for tubercle bacilli in the ordinary manner. The author claims that he has obviated any suspicion that the bacilli which he sees are other than those of tuberculosis. In 32 cases in which a subsequent autopsy was possible, the diagnosis was confirmed in every instance. An interesting observation followed the injection of bloods which were positive into guinea-pigs. While some of these pigs revealed tuberculosis at autopsy, many did not; in the latter, however, the bacilli were demonstrable in the blood. The author is permitting a series of injected, but apparently healthy, guinea-pigs to live, in order to note whether any of these animals subsequently develop tuberculosis. The blood was also studied in 112 apparently non-tuberculosis patients; all were negative but six. Of the latter, some showed evidences of tuberculosis after careful physical examination, examination of the feces or at autopsy. The author believes that the presence of these presumably avirulent bacilli in the blood accounts for those instances in which a focus of tuberculosis follows a trauma or surgical operation.

A Case of Injury of the Pulmonary Vein (*Ueber einen Fall von Verletzung der Vena Pulmonis*). PROF. FREIHERR VON EISELSBERG, Vienna. *Archiv für Klinische Chirurgie*, Vol. 89.

The history of this remarkable case, which had already been presented before the XXXVIIIth Congress of the German Association for Surgeons, is briefly as follows: A morphine habitué, aged forty-three years, attempted suicide by stabbing himself over the heart several times with sharp-pointed scissors. When the patient came to the hospital, one hour after the self-inflicted injury, he was in profound collapse and intensely anemic. The radial pulses were imperceptible; the heart-sounds were barely audible. Ten minutes after admission the patient was placed in a Sauerbruch chamber and the operation was begun (in the meantime unconsciousness had supervened and narcosis was unnecessary). The third and fourth ribs on the left side were divided, the pleura incised and the left lung pushed aside; then dark blood was seen welling up from an opening in the pulmonary vein immediately above the pericardium. The opening was ¾ cm. long and in the axis of the wounded vein. It was readily closed and made water-tight with six interrupted sutures. Immediately after the radial pulses became perceptible and steadily improved in quality.

After operation, the patient's condition was good, but he required large doses of morphine. One month after operation, signs of empyema appeared, and the plural cavity was drained after the resection of two ribs. Thereafter numerous subcutaneous abscesses developed, the general condition became poor, and the patient died fifty-four days after operation.

The post-mortem examination showed that the wound in the pulmonary vein had healed perfectly and that the patient would have recovered had it not been for his poor general condition (chronic morphine poisoning).

A Study of the Blood After Splenectomy, Following a Stellate Rupture of That Organ. JEROME MEYERS, Albany. *Journal of the American Medical Association*, April 17, 1909.

Myers reports the results of systematic blood examinations in a case of splenectomy in a boy eleven years of age, who suffered a stellate rupture of the organ from a fall from a tree. The operation by Dr. Vander Veer was a success and the recovery seemed complete, the boy a year later being apparently normal in all respects. The blood findings are tabulated and show a very remarkable variability in the red blood cell count, and the hemoglobin content normal or above normal, with no signs of even a moderate anemia. The leucocyte count was persistently above normal with a marked predominance of the lymphocytes. There is, however, a marked lack of neutrophile polynuclear cells which only dominated during an intracurrent gastric disturbance, showing that the ordinary relations between inflammation and polynuclear hyperleucocytosis are still striving to exist. Myers says: "That the removal of the spleen, which in embryologic life manufactures lymphocytes, gives a stimulus to the lymphatic apparatus of the body and thus causes a hyperlymphocytosis, is probable; that this stimulus is very great is evidenced by the lack of neutrophilic polynuclear hyperleucocytosis where we should naturally expect it; that it is lasting is evidenced by the relative and absolute hyperlymphocytosis seen later, after splenectomy."

Injection of Adrenalin to Avoid Hemorrhage During the Removal of Placental Rests After Abortion (*Adrenalininjektion zur Vermeidung der Blutung bei Entfernung von Placentarresten nach Abort*). O. GRASSER, Hermannstadt. *Zentralblatt für Gynäkologie*, June 19, 1909.

To avoid hemorrhage Grasser uses the following technic. The cervix is exposed and deep injection of the following solution is made into several points of the cervical tissue. Either 1 ccm. of 1% or 2 ccm. of ½% cocain solution, to which 3 drops of 1-1000 adrenalin solution has been added. It is then necessary to wait ten minutes. The operation of emptying the uterus is then nearly bloodless and the organ will be found firmly contracted, though the cervix remains patent.

A Warning Against Adrenalin (*Warnung vor Adrenalin*). N. N. *Zentralblatt für Gynäkologie*, June 19, 1909.

The anonymous author details two fatal results following the use of adrenalin injections into the cervix. In both cases, however, chloroform anesthesia was also given.

In both cases a solution of 1.0 c.cm. adrenalin to 10.0 c.cm. of salt solution was injected, the entire quantity of adrenalin given being 0.0003 (1/200). In the first case, one of total prolapse, vomiting set in, with immediate cessation of respiratory and cardiac action. The second case, one of chronic metritis, was identical in every detail, immediate death taking place during the cervical injection. Autopsy proved negative. Careful experimental study of the solutions employed showed nothing wrong or abnormal.

Report of an Interesting Brain Injury. H. B. GARNER. *Journal of the Michigan State Medical Society,* June, 1909.

A boy, three years of age, was struck on the head by a circular saw, just above the right eye, making a cut nine inches long, dipping down into the brain for a distance of two inches. Examination showed a wound, filled with pieces of bone, strips of meninges and fine sawdust. The following day a hernia of the brain developed. A proper aluminum plate was applied. Some few days later a pocket of pus was discovered just above the eye, which did not cease discharging until a large piece of dura mater sloughed out. The wounds eventually healed, and two years later the boy was perfectly sound mentally and physically.

Penetrating Injury of the Brain. Recovery. W. ARMISTEAD GILLS, Richmond. *Virginia Medical Semi-Monthly,* May 7, 1909.

Gills reports the unique case of a white man, aged thirty, who had shot himself with a .32-caliber revolver, the ball entering the right side of the head, two inches behind the upper temporal ridge and one inch above the zygoma, traversing the frontal region, passing entirely through the bone of the opposite side at a point midway between the frontal eminence and the superciliary ridge, an inch to the outer side, a skin incision being necessary to remove it. When first seen the man was almost pulseless, but conscious; the eyes were too swollen to permit their complete examination. Brain substance was found on the cheek.

The wound was drained on each side and an ice cap applied. The pulse ranged from 85 to 116; respirations from 20 to 26. Speech was for several days incoherent, and the patient appeared confused, making several attempts to get out of the window. The only focal sign present at any time occurred on the third and fourth day—twitching of the toes and fingers. About the eighth day the edema about the eyes disappeared sufficiently for the pupil reflex to be tested. It was found normal. Drainage was employed throughout, the wound healing promptly. Under conservative management recovery took place. For about three months the man complained of a constant pain in the occipital region, partial deafness and loss of sensation in the finger tips, all of which have entirely disappeared.

A .32-caliber revolver fires a missile whose velocity is low (700 feet per second); hence it is readily arrested and lodged, as in this case. On account of the low velocity there is usually little lateral displacement of energy (explosive effect), and most of the bone and tissue destruction is confined to the track of the ball. When velocity is low, the entrance and exit wounds do not differ much in size, nor is there surrounding destruction of parts. The presence of lead in the tissue, shown in a radiograph, is due to the fact that this was an unjacketed bullet and easily chipped off by bone when it passed through.

On Percussion as an Aid to the Diagnosis of Fractures of the Skull. J. H. PRINGLE, Glasgow. *Edinburgh Medical Journal,* June, 1909.

The author has found percussion to be of considerable value in the diagnosis of cranial fractures. The percussion is carried out by striking the scalp directly with finger, while the occiput rests upon the hand. Inasmuch as the note is different when the mouth is open or closed, the examiner should see to it that the mouth is open or closed throughout the examination. The note over corresponding points on the right and left sides of the skull should be compared. When a fracture exists in the neighborhood of any of the areas compared, the note will be found either (1) lowered in pitch over the fracture zone, or (2) in addition to the lower pitch, a cracked-pot quality is introduced. These changes, the author believes, will arise especially when there is comminution, or when the fracture is T, L or V-shaped. The author reports three cases in which this sign proved of diagnostic value.

An Interesting Case of Gangrenous Balanitis. WM. MEYER and WM. J. ROBINSON, New York. *The Critic and Guide,* August, 1909.

This case concerns a man of 60, whose ailment started in February, 1908, as an itching spot on the superior aspect of the glans penis, resembling a mosquito bite. It broke down into an ulcer, secreting freely and itching intensely. The ulceration progressed in depth and extent in spite of numerous antiseptic, soothing, astringent and other applications—invading the urethra and causing dysuria. By March, 1909, the glans presented a mass of ulceration on both the superior and inferior aspects and also within the meatus. Ill-smelling pus was exuding in abundance. Retracting the prepuce was difficult and painful. Microscopic examination revealed numerous cocci, but the Unna-Ducrey bacillus could not be identified. A mild cystitis existed. Copper sulphate solutions, 1-500 increasing to 1-100, were now tried, but in the course of the next month the condition became much aggravated. No relief had been secured in the preceding year by the use of lead and opium, bismuth subgallate, ichthyol, silver nitrate, balsam of Peru, sublimate solution, hydrogen dioxide, copper sulphate, etc., etc. In April, 1909, the patient was instructed to dip the penis four times a day for fifteen minutes each time in a 1:1000 solution of chinosol, afterwards dusting the glans with pure chinosol. The pain on urination disappeared within an hour or two after commencing the treatment. (Chinosol, besides its antiseptic properties, seems to possess a decidedly anesthetic effect in some cases.) The secretion rapidly diminished and there were healthy granulations visible on the third day. Within one week the entire glans was healed, without leaving any cicatrices, and it is impossible to tell at the present time that the glans had been the seat of deep u cerations.

Three other cases of extensive phagedenic ulceration and chancroids have since been similarly treated and the results have been in the highest degree satisfactory in every case. If pure chinosol seems to be too strong it may be diluted with boracic acid or talcum, in strengths of 5 to 20 per cent.

The Luys Urine Separator. *Second Report of 41 Cases.* B. S. BARRINGER, New York. *Boston Medical and Surgical Journal,* April 22, 1909.

1. There is a class of cases in which knowledge of the condition of the kidneys is necessary and in which the ureters cannot be catheterized. These cases are those in which (a) one or both ureteral openings are obscured by cystitis or (b) in which the rapid excretion of pus or blood into the bladder clouds the bladder fluid. These are cases in which the separator is invaluable.

2. In children, the child's model of the separator, 17 F., may be used when ureteral catheterism is impossible because of the large size of the catheterizing instrument.

3. Cystitis forms no barrier to the use of the separator and to obtaining an exact knowledge of the kidney conditions in such cases. The exception to this is when a bacteriological examination is necessary, when catheterization of the ureters is more accurate.

4. Separation is much simpler than ureteral catheterization. The sterilization of the instrument is absolute, as the separator can be boiled. Infection of the ureters from the bladder is excluded.

5. In women the pain or discomfort caused by the separator is about the same as that caused by the use

of a simple examining cystoscope. In men the pain of separation is slightly more marked.

6. There are certain classes of cases in which the separator cannot be used. They are the following: (A) Those in which the bladder capacity is less than 20 ccm.; (B) those in which the urethra is not penetrable to the instrument, and (C) those in which the base or neck of the bladder is distorted by (a) marked prostatic hypertrophy; (b) extreme anteversion or anteflexion of the uterus; (c) certain uterine tumors and (d) marked cystocele.

7. Slight hemorrhage occurs in some cases resulting from the bladder muscle grasping the instrument too vigorously and causing trauma of the vesical mucous membrane. This is shown by (a) small blood clots along the membrane when the separator is withdrawn; and (b) slight and equal increase in the fresh red blood cells of both sides.

8. Any inaccuracy of results obtained by the use of the separator is to be attributed to its employment in unsuitable cases or to a failure to recognize traumatic hemorrhage when it occurs, and does not arise from leakage of the urine from one side to the other.

The Value of Mixed Toxins of Erysipelas and Bacillus Prodigiosus in Inoperable Sarcoma, Based Upon a Study of Cases Treated During the Past Sixteen Years. WILLIAM B. COLEY. *Detroit Medical Journal*, June, 1909.

Coley believes that the mixed toxins should be used—

1. In all cases of inoperable sarcoma, except the melanotic, which are probably of epithelial origin.

2. In cases of sarcoma originating in the long bones, in which operation means the sacrifice of the limb.

3. Immediately after operation (within a week or two) in all cases of primary inoperable cases, as a prophylactic against recurrence.

4. In addition to the foregoing, after primary operations for carcinoma, as a prophylactic against recurrence.

The use of the toxins as a prophylactic after operation, he believes, offers by far the most important field of all, the proportion of recurrences in his own experience thus far being less than 25 per cent., whereas, in cases in which the toxins were not used after operation, the proportion of recurrences has been fully 75 per cent. While he does not believe that nearly so good results are likely to follow the use of toxins after operation for carcinoma, yet, inasmuch as the treatment, if properly given, is free from danger and entails little discomfort to the patient, it is certainly worth trying, and recurrence may be prevented in a goodly number of cases.

A Report of Two Cases of Osteoplastic Carcinoma of the Prostate, with a Review of the Literature. GEORGE BLUMER, New Haven. *Johns Hopkins Medical Bulletin*, July, 1909.

The author summarizes as follows:

1. Carcinoma of the prostate gives rise to metastases in the bones in a much larger proportion of cases than any other form of carcinoma; probably in at least two-thirds of the patients in whom the disease is allowed to run an unobstructed course. 2. The clinically apparent bone metastases may be single. If occurring in the long or flat bones it may be taken for a primary bone tumor and removed as such. If occurring in the vertebrae it frequently gives rise to spastic paraplegia. 3. There is a diffuse form of bony involvement without evident deformity of the bones in which intense pain in the bones, often associated with spinal stiffness and accompanied by the general signs of a malignant growth, is the prominent symptom. 4. Symptoms pointing to the urinary tract as the original site of the disease are lacking in perhaps one-third of the patients. 5. In all instances where a male patient, especially one over sixty, presents himself with an apparently primary tumor of a bone or with signs of paraplegia, or with bone pains of obscure origin, a complete examination of the urinary system is indicated, even though no symptoms of urinary disorder be present. Needless to say, the mammary gland, the thyroid and the region of the adrenals should also be explored. 6. The high percentage of cases of bone metastasis in this form of tumor and the relative rapidity with which it may take place makes it imperative that carcinoma of the prostate should be recognized and removed as early as possible.

Removal of Superfluous Hairs by Improved Methods. H. H. PIRIE, London. *Lancet*, June 19, 1909.

Pirie advances the following modifications to the conventional electrical method: 1. The needle should always be connected to the negative pole. 2. Instead of a very fine needle, the author recommends the finest hypodermic wire; because of the blunt point and its extreme fineness, wire has less tendency to make a false passage than a needle; he believes, therefore, that there is better assurance that the bulb of the hair only is attacked. 3. The wire should be insulated with shellac except for a distance of one-sixteenth of an inch at the tip; this prevents scarring.

Hydriatic Treatment of Burns and Other Defects in the Skin (*Hydriatische Behandlung von Hautdefekten*). W. WIRZ. *Therapeutische Monatshefte*, June, 1909.

Wirz has for many years employed, with gratifying results, Winternitz's hydriatic treatment of burns, etc. It relieves the pain and supplies a temporary protective substitute for the skin. This substitute is a piece of thin linen fitting close over the defect and held by strips of plaster around the edges (or applied as a bandage). It is left for two or three days, kept cold and moist by a thick compress, renewed at first every minute, as the cold reduces the pain. Later the intervals are lengthened to five minutes or more, and by the second day the compress need not be renewed for hours. A temperature of 50° F. is most effectual at first, but later up to 68° F. may be employed. This dressing protects the terminals of the sensory nerves from irritation; the secretions become organized under the protecting shield, and the scar is much less disfiguring than with other methods. Winternitz leaves the linen for a week, merely washing over it frequently; Wirz changes it about the third day.

Dry Heat as a Therapeutic Factor in Gynecology. G. GELLHORN, St. Louis. *American Journal of Obstetrics*, July, 1909.

The author applies the heat by means of a cradle-like box placed over the patient. Inside are eight electric light bulbs and several small bags of calcium chloride, which keep the air within the hot box dry. Under these conditions temperatures of 200-220° are readily born for from twenty to thirty minutes. Hot air is of use in pelvic exudates (after the febrile stage has passed); in infantile uteri to combat the amenorrhea, at times in virginal dysmenorrhea if applied a week before the flow, in post-operative shock to raise the temperature; in induration of wounds, in recent post-operative adhesions, etc. The applications must be carefully supervised by the physician, and the patient's individual tolerance established by beginning with short applications of lower temperatures (180°).

A New Method for Attempting to Secure Sphincteric Control After Colostomy. CHARLES RYALL, Brompton, Eng. *The Lancet*, July 3, 1909.

The rectus is split vertically, and the sigmoid is drawn out and divided at a convenient point. The lower segment is closed and replaced in the abdomen. The upper segment is made less bulky by removing the appendices epiploicæ and freeing it of mesenteric fat, but without interfering with its blood-supply. A loop of muscle fibers is separated from the posterior aspect of the rectus on either side of the wound. Each loop is then drawn over to the opposite side of the wound, so that one loop overlaps the other. The overlapping loops thus form a ring

and through this the bowel segment is drawn. Sutures are then inserted to keep the muscle fibers together above and below where the bowel comes through. Anchoring stitches are inserted through the skin and muscle inside to keep the bowel in position. The wound is then closed above and below the bowel and the cut edges of the latter are sutured to the skin. A double sphincter is thus formed consisting of longitudinal and circular fibers. The longitudinal fibers are those of the anterior portion of the rectus and the circular fibers are formed by the loops from the posterior part of the rectus. This operation can be modified by making double loops on each side and making them overlap one another alternately.

The Treatment of Post-Partum Hemorrhage (*Beiträge zur Behandlung der Post-partum-Blutungen*). A. LABHARD, Basel. *Muenchener Medizinische Wochenschrift*, June 15 and June 22, 1909.

The author deals only with extreme cases of atony, in which ordinary measures, such as intrauterine irrigation, compression of the aorta, clamping of the uterine vessels, etc., etc., have failed. In nearly 39,000 labors, 22 such cases occurred. He has found that intrauterine tamponage here is useless, as the uterus fails to contract and bleeding continues.

Under these desperate conditions he makes a rapid laparotomy (10 cm. incision), draws out the uterus through as small a hole as possible and compresses the pedicle with an elastic ligature or even with a piece of boiled twine. The parietal peritoneum is then sewn to the cervical peritoneum and the cervix surrounded with gauze. Should no proper facilities be at hand, the uterus can be covered with sterile towels and the patient transported to a hospital. In any case the uterus is amputated and the stump treated extraperitoneally. Needless to remark, these extreme measures are rarely indicated.

"Desensibilization" Against Rontgen and Radium Rays (*Ueber Desensibilisierung gegen Röntgen- und Radiumstrahlen*). G. SCHWARTZ, Vienna. *Muenchener Medizinische Wochenschrift*, June 15, 1909.

In efforts to reach deeper parts the skin frequently suffers during *x*-ray or radium exposure, such as is required for blood diseases and other therapeutic measures. The author found that plant embryos, when in a "latent" state, did not suffer by exposure. He theorized and found that where the vital metabolic processes were nearly in abeyance the rays proved harmless. When applied to human beings he found that by markedly compressing the skin (anemia, retardation of lymph supply) both radium and *x*-ray caused no burns or even hyperemia, while uncompressed areas showed the usual effects. With radium the capsule was firmly pressed against the skin; with *x*-ray wooden plates were used to make pressure. Possibly other means—mechanical, chemical, thermal—may prove more effective.

Local Anesthesia for Dilatation of the Cervix and Operations Upon the Portio Vaginalis (*Beitrag zur Lokalanästhesie bei der Dilatation des Cervical-Kanals und Operationen an der Portio*). O. HENKICH, Strassburg. *Zentralblatt für Gynäkologie*, April 10, 1909.

The posterior vaginal wall can be readily rendered anesthetic by means of injection of small doses of adrenalin and eucain. (The anterior vaginal wall is almost insensitive), but the cervix requires more thorough measures. For the cervix the following formula is employed: Beta eucaine, 0.1; sodii chloridi, 0.06; adrenalini, 1-1000, 0.8; aq. dest. ad., 10.0. 1 1-5 ccm. of this solution injected in four spots deeply into the cervical tissues, and a little more injected into the cervical canal itself, suffice. It is necessary to wait five minutes, the cervix becoming noticeably pale from the effect of the adrenalin. Careful dilatation now produces no pain, and curettage may be performed without causing much discomfort. Small operations such as trachelorrhaphy or even amputations of the cervix can be painlessly performed by aid of this procedure.

The Treatment of Inoperable Cancer of the Uterus. G. GELLHORN, St. Louis. *American Journal of Obstetrics*, May, 1909.

The author reports his experience of two years' treatment by means of his own method. Inoperable uterine cancer requires something to stop the hemorrhage and control the foul odor. Gellhorn under narcosis performs a thorough excochleation; dries the resulting crator and with the patient in Trendelenburg's position, by means of a Ferguson's speculum keeps from 1-2 to 1 oz. of pure acetone in contact with the lesion for from 15 to 20 minutes. The crater is then packed with acetone gauze. To protect the parts, the vulva and lower part of the vagina are well vaselined, the outside of the speculum also. All further treatment may be ambulant, as no more excochleation is required, and the acetone applications, twice weekly, can be made at home or in the office. Where the direct application of the acetone is difficult, as for instance, in the interior of the uterus, bisulphite of acetone, a white powder, may be applied with an insufflator. This salt soon sets free the acetone.

Acetone acts by hardening the tissues and thus rendering them less liable to secondary bacterial invasion. It has no curative action.

Lung Suture in Gunshot Wounds (*Ueber Lungennaht bei Schussverletzungen*). M. BORCHARDT, Berlin. *Berliner Klinische Wochenschrift*, April 5, 1909.

Borchardt reports two cases in which he performed the operation of suture of the lung for perforating gunshot wound. The continuance of hemorrhage was the indication for the operation. One patient recovered. In both instances the suture was highly effective in checking the hemorrhage. The author believes that this operation should be performed oftener than it is and mentions as indications, continued hemorrhage, expansion, pneumothorax and extensive subcutaneous emphysema. The author advocates an extensive exposure by means of a large osteoplastic flap. He says that the operation had best be performed under positive pressure with the aid of the Brauer apparatus.

What is the Effect of Specific Therapy Upon the Wassermann Reaction? (*Wie wirkt die spezifische Therapie auf die Wassermann—A. Neisser—Brucksche Reaktion ein?*) A. PÜRCKHAUER, Breslau. *Muenchener Medizinische Wochenschrift*, April 6, 1909.

The author has studied more than 800 hundred cases of syphilis in which the "deflection of complement" test had been instituted one or more times. As a result of his studies he concludes that the proper treatment of the disease, as heretofore, should consist of intermittent but frequently repeated courses of treatment (injection or inunction). The earlier and more energetic the treatment is instituted, the sooner does the reaction become negative. In late secondary or tertiary manipulations the reaction is much harder to influence than in the early stages. Leukoplakia is almost invariably of syphilitic origin. The treatment during the secondary period must be faithfully continued whether there are manifest symptoms or not.

A Simple but Rational Operative Method for Prolapsus Recti in Children (*Eine Einfache aber Rationelle Operative Behandlungsmethode des Prolapsus Recti bei Kindern*). G. EKEHORN, Sweden. *Archiv für Klinische Chirurgie*, Bd. 89, Heft 2.

In four cases of severe prolapsus not cured by other methods, the author has proceeded as follows: The prolapse is reduced, and one finger inserted into the rectum as a guide. A long needle armed with heavy silk is passed through skin and soft parts to one side of the lower end of the sacrum directly into the rectal lumen. The thread is withdrawn and the needle removed. Similarly the needle is passed into the rectum from the other side of the sacrum. It is threaded with the end of the silk strand lying in the rectum and is then withdrawn. Thus the two ends of the single silk suture come out one on each side of the sacrum. They are drawn taut and tied together across the sacrum. The suture is removed after 10 days.

The author has found both the immediate and late results perfect after this simple operation.